Risk Assessment in the Workplace – Standard of Best Practice

MRC policy is to provide a safe environment and to employ best practice to ensure health, safety and welfare within the workplace. This document sets the expected best practice guidance for risk assessment in the workplace under MRC Health and Safety Policy.

Introduction

This document states best practice guidance on risk assessment and outlines the methodology for achieving suitable and appropriate control of workplace risks. The general approach is to assess risks area by area in the workplace. This does not negate the need for process-based assessments or even individual assessments for the most hazardous substances or activities, but it should result in safe working practices that take into account all activities that are carried out by all those working in any specific area.

Scope

The guidance contained in this note relates to all activities in the workplace. The general guidance is applicable to all units, both laboratory and non-laboratory. Where appropriate, links are given to other documents that relate to specific aspects of work (e.g. Display Screen Equipment) and those relating to safety management, specifically that covering the health and safety responsibilities of line managers, employees and visitors.

Definition

This document refers to **Team Leaders**. The names of identified Team Leaders will be included in the local health and safety policy statement. The majority are **research team or group leaders**, but in addition the definition includes other **function managers** such as senior administrators, workshop supervisors, and infrastructural and laboratory managers.

Responsibilities

Directors are responsible for the implementation of this best practice guidance. It is intended however that the major duties will be delegated to identified Team Leaders.

Although Team leaders are responsible for ensuring assessments are in place, the task of carrying out those assessments is properly delegated to individuals with the appropriate knowledge and experience.

Director's summary

This guidance is designed to assist units and teams through the process of assessing the risks in the workplace.

This guidance has four major sections with accompanying appendices. If followed they should (a) increase awareness of the principles of risk assessment and (b) enable our staff to assess the risks of their proposed work and implement the appropriate control measures to ensure safe working.

Guidance Note 1:	**Risk management**, which identifies responsibilities and provides guidance on a suitable area-based approach and its implementation **Appendix 1 -** Guidance on Standard Operating Procedures (SOP)
Guidance Note 2:	**Guide to risk assessment**, which defines significant terms and describes the essential steps of risk assessment **Appendix 2** – Matrix approach
Guidance Note 3	**Area based assessment**, which promotes consideration of collated procedural assessments **Appendix 3** – Template for Area assessment
Guidance Note 4	**Procedure based risk assessment** for laboratories. **Appendix 4** – Template for laboratory procedure assessment

Directors must ensure the requirements of this best practice guidance are met.

This can be achieved primarily through:

1. Ensuring identified team leaders understand and discharge their responsibilities for risk assessments;
2. Providing each identified team leader with a copy of the appropriate Guidance Note(s)[1];
3. Establishing a system to ensure that risk assessments are completed and regularly reviewed;
4. Ensuring the implementation and proper use of all risk control measures and, where required, proper maintenance and testing of risk control equipment.
5. Taking appropriate action on non-compliance with the use of risk control measures determined through risk assessment.

[1] Units may adapt the notes for local use, but are not free to either omit any significant points of guidance or practice, or to lower the standards set out in the guidance. Local notes must still be distributed according to Point 2.

Guidance Note 1 - Risk management

Responsibility for risk assessment

The Director is responsible for ensuring that systems for managing health and safety are in place and that suitable and sufficient risk assessments are completed and kept up to date. In support of this, the MRC Health and Safety Policy Statement places the responsibility with the team leader for ensuring the risks associated with their work are assessed and recorded where appropriate.

For most workplaces, hazard identification and risk assessment can be done effectively initially area by area or room by room. For areas where hazards and hence risks are low, this will be sufficient. The identification of the hazards may however identify those where further assessment is required. The higher hazards will determine the overall risk controls (engineering or PPE).

For laboratory work, this can be done effectively by subdividing the work into its natural research projects and making assessments on a research team basis. Collectively these assessments will determine the controls within an area. Establishments may wish to involve the local Safety Coordinator in advising supervisors of such work.

In practice the team leader may wish to delegate the work of preparing an assessment to another member of the team with appropriate knowledge and experience but responsibility for approving and signing the assessment remains with the team leader. The remainder of this Guidance Note is addressed to the team leader.

Risk management

Overview of responsibilities

Preparing a risk assessment is only part of risk management. Your health and safety responsibilities embrace all aspects of the work. Briefly these are to ensure that:

- All risk assessments are made to the required standard
- Your facilities including equipment and your work practices are all to the required standard
- Your staff are competent
- Your staff are aware of and understand relevant risk assessments
- All risk control measures are implemented and properly used
- The work is monitored
- Procedures are periodically reviewed.

Competence of the assessor

Competence is defined as possessing sufficient knowledge, skill, experience and positive attitude to perform a task effectively; which in this case is to make a suitable and sufficient risk assessment.

The Team Leader is responsible for ensuring risk assessments are both made and that they are suitable and sufficient. However the actual task of making an assessment can be delegated to another individual, from within or possibly outside of the team.

The Team Leader may on occasion wish to give the task to an inexperienced member of the team, such as a PhD student, as a training exercise. The final judgement on the

hazards, risks and appropriate control measures must be made by a person with the required competence.

A note on compliance

On the specific matter of compliance, managers must recognise that where an assessment identifies that a particular control measure is necessary, then it is a requirement that it is used. All laboratory work must comply with the MRC Code of Good Laboratory Practice. Non-compliance is regarded as a serious disciplinary matter.

Approach to risk assessment

Wherever practicable the risk assessment should look at the whole work area. Opportunity should be given to all those that work in a specific area, e.g. an office, a workshop, or a laboratory, to discuss the hazards and risks present and determine the appropriate control measures. Staff should be encouraged to go through their tasks and identify a) if one area assessment is possible where the risks are low or negligible or b) if further detailed assessments are required.

Risk assessments do not need to be recorded where there are no significant risks. However, you must show evidence that you have been through the risk assessment process to reach that conclusion. To give two examples:

Example 1: An office. Those that work in a clean well run office, free of trailing wires and clutter, may identify there are no significant hazards present and no specific risk control measures are required. A simple note recording that this decision has been reached, together with a very brief 'good-housekeeping guide' designed to keep it that way (e.g. maintain routes and fire evacuation routes free from clutter) could be sufficient.

Example 2: A general laboratory. Laboratory staff may identify (after reading Guidance Note 3, or its local adaptation) that all substances used are low hazard and in sufficiently small quantities for the risks to be insignificant. If all work can then be done following a local Code of Good Laboratory Practice at least equivalent in standard to the MRC Code of Good Health and Safety Practice then detailed assessments for each substance or procedure would not then need to be undertaken.

Risk assessments based on procedure will still contribute to any area assessment and will still need to be recorded where there are significant risks. Grouped procedural assessments will determine the control measures to be adopted within the whole area. The hazardous properties of individual substances must still be identified initially, but the assessment of risk must always be in the context of the proposed work.

The opportunity should also be taken whenever it is appropriate to make use of generic risk assessments. This can be interpreted in two ways, each of which may be valid in defined circumstances. In the first case, 'generic' is defined as a procedure (or in exceptional cases the defined use of a specific hazardous substance) that is common to more than one research team of one or more people. One team can adopt a risk assessment of another team or individual for their own work. This can save a great deal of time and effort, but comes with the caution that the 'adoptive' team must still establish the assessment covers fully their own circumstances.

The second definition of 'generic' relates to families of compounds where the assessment focuses on common properties. Thus, for example, there may be the opportunity to assess the common risks of handling strong acids or strong bases in some circumstances.

You should approach a risk assessment systematically. Newly devised procedures should make use of the existing structures set up within establishments to ensure health and safety. This includes referral to existing codes of practice and local rules wherever possible. Where the proposed work includes the development of novel techniques or first use of generic groups of hazardous substances, consideration should be given to the development of a code of practice or standard operating procedure (SOP) for future referral.

The use of a matrix in evaluating risk can be a valuable aid. Further guidance on the risk assessment process is included in **Guidance Note 2** and guidance on the use of a risk matrix can be found in **Appendix 2**.

If your work changes sufficiently to warrant a change to the risk assessment and the determined risk control measures, the area or room assessment should be revisited and changes to engineering or PPE-based controls must be communicated to all those working in that area.

Recording assessments

The result of your assessment should be recorded where any significant risks are determined. Use of a form is not a statutory requirement. Many find however, that the use of a form is helpful both to guide the assessor through the process and to provide a record of what has been done. We have provided forms that may be used to guide area and procedure assessments and these are set out in **Appendices 3 and 4**.

Relationship with host institution

If your Unit or team is closely integrated with a host institution it may be more appropriate for you to use local schemes. This is acceptable provided the standards achieved are at least as high as those set out in this guidance note and in other related notes, e.g. that on Eye Protection and the Code of Good Health and Safety Practice.

Suitability of assessments and control measures

It is likely that your establishment already has Local Policies and Procedures and, where appropriate, Standard Operating Procedures (SOPs). Your risk assessments may properly conclude that through the application of existing procedures, exposure to risk can be prevented or controlled to the point where there is no longer a significant risk to health. Your assessment is then complete but you then have the responsibility to ensure that the procedures are followed in practice, to assess any new work activities and to review the assessments regularly.

Any deficiencies identified during the assessment will need to be remedied, either by modifying the work activity or implementing appropriate control measures to minimise the risk of harm. In extreme cases the work may be halted until suitable engineering control measures have been installed and/or procedures have been revised. The assessment process may also identify additional training needs for your staff.

A risk assessment may conclude that there is a significant risk of harm remaining which cannot be mitigated entirely through the use of engineering controls. Mitigation may only be possible through adherence to specified steps that rely at least in part on the competence of the operator. In these circumstances the risk assessment may specify specific methodology in the form of an SOP.

Standard Operating Procedure (SOP)

An SOP may be required where there is the need to ensure that a procedure is carried out for qualitative control purposes. The SOP will be written to ensure that results are highly reproducible irrespective of the person actually doing the work. An SOP may also be required where, for example, there may be serious consequences to the operator and possibly others who may be affected by the operation, if a procedure is not done following a precise protocol.

Where there is a serious risk to either the operator or others the first option should always be to eliminate or control the risks through the implementation of engineering controls. In some situations however, a safe system of work can only be achieved by performing the task or tasks in a particular way and sequence as described in the SOP.

Where an SOP is required the Team Leader carries the responsibility to ensure:

- The SOP is comprehensive and unambiguous
- The SOP makes clear what **must** be done **and** what **must not** be done
- That all those persons performing the task are properly trained
- That all those persons performing the task rigorously adhere to the SOP.

To deviate from an SOP is a disciplinary offence. Further guidance is provided in **Appendix 1**.

Advice and support

Unit Directors are responsible for ensuring that all risk assessments are in place and are up to date. The MRC Corporate Safety, Security and Resilience team, supported by local safety personnel, are available to give advice particularly on conducting the minority of assessments where real control problems are highlighted.

It is not the function of the Corporate Team to conduct assessments on behalf of others. They will provide information, support and advice on training where the need is identified.

Neither should safety committees have a role in making the initial risk assessment, as this is a management responsibility. It can however be useful if safety committees see and comment on assessments as this provides a means of meeting the requirement to disseminate information. They may be able to contribute by identifying common problems for which a new local code of practice would be useful and in helping to draw up such codes of practice.

Your local safety inspections will have an important role in monitoring the effectiveness of the specified safety precautions.

Appendix 1. Guidance for creating a Standard Operating Procedure (SOP)

Purpose:

SOPs can be valuable research tools that are worth the time and effort required to prepare them. A well-written SOP is part of the risk assessment exercise and provides a written means to instruct workers on how a particular procedure is carried out including the identification of any hazards and the controls that must be employed to ensure that no harm or damage is realised.

An SOP can also be used to satisfy legal compliance requirements. For example, compliance with requirements for the handling of defined human pathogens at each level of containment.

In that example, biosafety procedures are incorporated into the SOPs or into a biosafety manual. All affected persons (employees and visiting workers) must be advised of specific hazards and should be required to read and follow instructions on practices and procedures.

SOPs should be written for quality control purposes and for procedures that pose an identified potential risk to the health and safety of the worker and of others present in the workplace. A separate SOP does not need to be written for each individual experiment, just for specific procedures.

The process of writing SOPs requires an individual to think through all steps of a procedure and eliminate potential risks before work commences. This process allows for standardization of materials and methods, resulting in quality research as well as identifying any safety issues associated with the procedure.

General Guidelines:

Every SOP should include:

- date written, dates of revisions, name of person that wrote the SOP
- procedural methods/materials (detailed enough to allow someone to complete the procedure without reference to other material)
- risk identification
- exposure controls
- waste disposal (where applicable)
- spill procedures (where applicable)
- accident procedures
- any pertinent references
- any required record keeping

SOPs must be specific. They should not consist of copies of inserts, manuals from other sources, or another area's SOPs (unless work is collaborative and carried out in the same research space). You may, however, wish to refer to other documents.

Steps to writing a SOP:

Step 1

Determine how detailed the SOP should be. Always ensure that each step in any procedure is clearly explained. Review protocols and identify the potential hazards associated with the procedures performed in the protocols

Step 2

Determine the exposure risk to the identified hazards that each step in the SOP could present.

Step 3

Determine the risk control plan that staff must adhere to in order to minimise the risk of harm. The plan must include each risk identified in Step 2 and the necessary control measures. It should include personal protective equipment required and applicable work practices.

Step 4 (where applicable)

Identify the types of wastes that will be generated and plan for how they will be treated/disposed of.

Step 5 (where applicable)

Develop a specific plan for how spills and accidental exposures will be handled. You should list emergency procedures including location of emergency equipment, emergency contact information with phone numbers, spill clean-up/decontamination methods, and when and how to seek emergency medical care.

Step 6

Include who the individual should notify in case of an accident and how to file an accident report.

Completed SOPs should be:

- Brief, succinct, and directly applicable.
- Used to train all new employees.
- Reviewed with employees as part of an annual safety update training programme.
- Reviewed annually for accuracy and completeness by supervisor and staff.
- Available in the laboratory for reference.
- Signed by supervisor or team leader.

Testing the SOP

Once drafted it is highly recommended that the SOP is tested by those that are required to use it (possibly but not necessarily using a dry run). This process confers a sense of ownership to all those that use it as well as ensuring the SOP is accurate and appropriate.

Guidance Note 2 - Guide to risk assessment

Definitions

Within the context of this document the following definitions apply.

Risk assessment "a systematic examination of the hazards associated with the work, an evaluation of the risks to health associated with the hazards and a judgement on the measures required to eliminate or control harmful exposure to the hazard".

The definitions of hazard and risk are quite distinct and must not be confused. In line with other MRC documentation and training the following apply here:

Hazard - the potential to cause harm or damage

Risk - the chance of that harm occurring

Risk is calculated as -

Potential severity of harm
(the consequence – or damage)

x

Likelihood of harmful event occurring

Introduction

Adherence to the guidance in this and associated notes should ensure compliance with MRC policy and legislative requirements.

Before detailed and specialised assessments are made for specific activities, rooms or substances, the assessor should be familiar with the concepts and philosophy of making assessments. It should be possible to break down all assessments into the five basic steps. Once familiar with this approach, it should become instinctive in its application to all work activities.

Steps for risk assessment

Introduction

This guidance can be read in conjunction with the making of your risk assessment and where appropriate the completion of a form (examples of laboratory procedural and area templates are given in **Appendices 3 and 4**). It takes you through the hazard identification process and principally should help you judge if existing control measures are suitable and sufficient or if additional measures are required.

Before you start

Why do I need to conduct an assessment?

It is the best way to ensure a safe system of work. Legally, a record is to be completed wherever significant risks are identified. The use of a form can be useful to determine if any risks are significant.

How do I approach it?

The risk assessment concerns the hazards and risks **in the context of the proposed work**. Assessments for activities should be **procedure** based and **not substance** based. The project description can be fairly broad. It can be a procedure, e.g. 'polyacrylamide gel electrophoresis', or a project title, e.g., 'sequencing of DNA' or 'using a lathe' or 'conducting visits in the community'. Once all procedures have been assessed the recommended approach is to consider the workplace area by area. This will establish the control measures required by all those who work in or visit that area.

To make a proper valued judgement for a laboratory assessment however and to meet the requirements of the Control of Substances Hazardous to Health Regulations this still means you must be aware of the hazardous properties of each substance you are using and the chemical entities produced as a result of the procedure, including intermediates.

Justification and Substitution

Before proceeding with the **record** of your risk assessment you must first justify

- The use of each hazardous substance and confirm that a less hazardous substance cannot be substituted.
- The use of radioisotopes and confirm that there no other, safer alternatives.

For work in the community, are visits to certain homes or districts justified in the context of the aims of the research? Is transport by car safer than public transport or vice-versa? These decisions cannot be made until you have identified and analysed the hazards, but this duty should be borne in mind throughout the process. It can save your time.

The very first step

Before the first of the five steps can be taken, there is an important question to address, namely, 'What is it we are proposing to do and how do we propose to do it?'

The accompanying flow-chart shows the five steps that follow.

All risk assessments, even if the eventual objective is to achieve a room or area assessment, are based on tasks, procedures or the working environment. A room or area assessment is effectively the sum of the parts and, although it may take a little longer to achieve in certain work environments, should or could lead to a code of practice that incorporates all the significant hazards and controlled risks.

The starting point is likely to involve a draft procedure (e.g. laboratory processes, patient or volunteer studies, machining materials in the workshop) or outlining a task (e.g. manual handling, using a PC or laptop).

It is only after this is done, that the first of the five steps can be started.

Step 1. Hazard identification

This is the identification of all, objects, substances or activities that have the potential to cause harm within the planned task or process. There is little value is saying a moving car is a hazard, unless it is placed in the context of the process, e.g. crossing the road, or driving from A to B.

You should also address at a very early stage your own competence or that of others to make judgements on risk and on whether the hazards can be removed or reduced. Questions include:

- How much do I know about the hazards?
- Do we need to do the task or use the hazardous material at all?
- Can we substitute the task or material with one of lower hazard?

These each give the potential to remove or reduce risk at the outset.

Step 2. Who may be harmed and how?

There are two sets of people to be identified: those that are doing the work and those others that may be affected by it.

When reviewing a procedure for example, you should address who is likely to do the work. The ideal is that only those who are trained and competent will do so. But other factors come into play:

- Youth
- Maturity
- Experience
- Disability
- Health
- Pregnancy

Are all examples that may influence how you assess the risks.

Similarly you should consider who may be affected. Clearly the most likely are those who share your workplace and this consideration may assist when pooling procedural assessment and creating a room or area assessment. But others include:

- Contractors
- Visitors
- Neighbours (think of possible emissions)

Step 3. Evaluating the risks

In our typical workplace setting, this can be the most daunting part of the assessment. The starting point will be to collate all relevant and important information about the hazards. For moving a load, details on its weight, size and balance will each contribute toward a judgement on its potential to cause harm. For chemicals and biological agents, data sheets are available that provide information on toxicity or potential to cause infections. The information generally leads toward a judgement on severity, so the second parameter of frequency, or likelihood, is examined to determine the chance of harm occurring. This includes how many people could be exposed and how often will the task or procedure be done.

For every type of assessment it is possible to visualise the risk through the use of a matrix and reach a conclusion on the need to introduce control measures that is proportionate to risk.

If you find it helpful to do so, more information is included in **Appendix 1**.

The objective for this step is to identify what is the maximum potential for harm within the defined task or procedure, in terms of possible harm and the chance of it happening.

Step 4a. Control measures - existing

Always make use of what already is in place when determining appropriate control measures. There is no need to reinvent the wheel each time. If a new procedure can be done safely using existing control measures, such as those set out in a Code of Practice, the assessment is complete, with the recorded assessment confirming that fact. Always ensure you provide appropriate instruction, information and training to staff on applying control measures.

Step 4b. Control measures - additional

For new procedures however, it may be necessary to introduce additional measures. If the conclusion is that applying the new measures controls exposure to harm to an acceptable level, the assessment is done. This may then generate modifications to existing codes or procedures. Changes may lead to additional requirements for instruction, information and training of staff.

Recorded assessments must be kept for an appropriate period and guidance is given in MRC Record Keeping Best Practice Guidance.

Hierarchy of control

What this means is there is an order in which you should consider taking control measures. The overriding principle is that measures that can be taken to protect all or the majority of those doing or affected by the work always take priority over measures taken to protect the individual. Essentially this is done through applying the hierarchy. The order is:

1. Elimination
2. Substitution
3. Control
    a. Engineering (including enclosure, guarding, ventilation etc))
    b. Work practices
    c. Use of personal protective equipment (PPE)

If Options 1 or 2 are possible, that constitutes the end of the assessment. If Option 2 is selected, a new assessment begins to assess the risks of the less harmful task or substance.

Where control is required under Option 3, engineering measures take priority. Examples can include:

- Hoists
- Fume cupboards
- Safety cabinets
- Machine guards
- Interlocks
- Filtered air supply and extracts

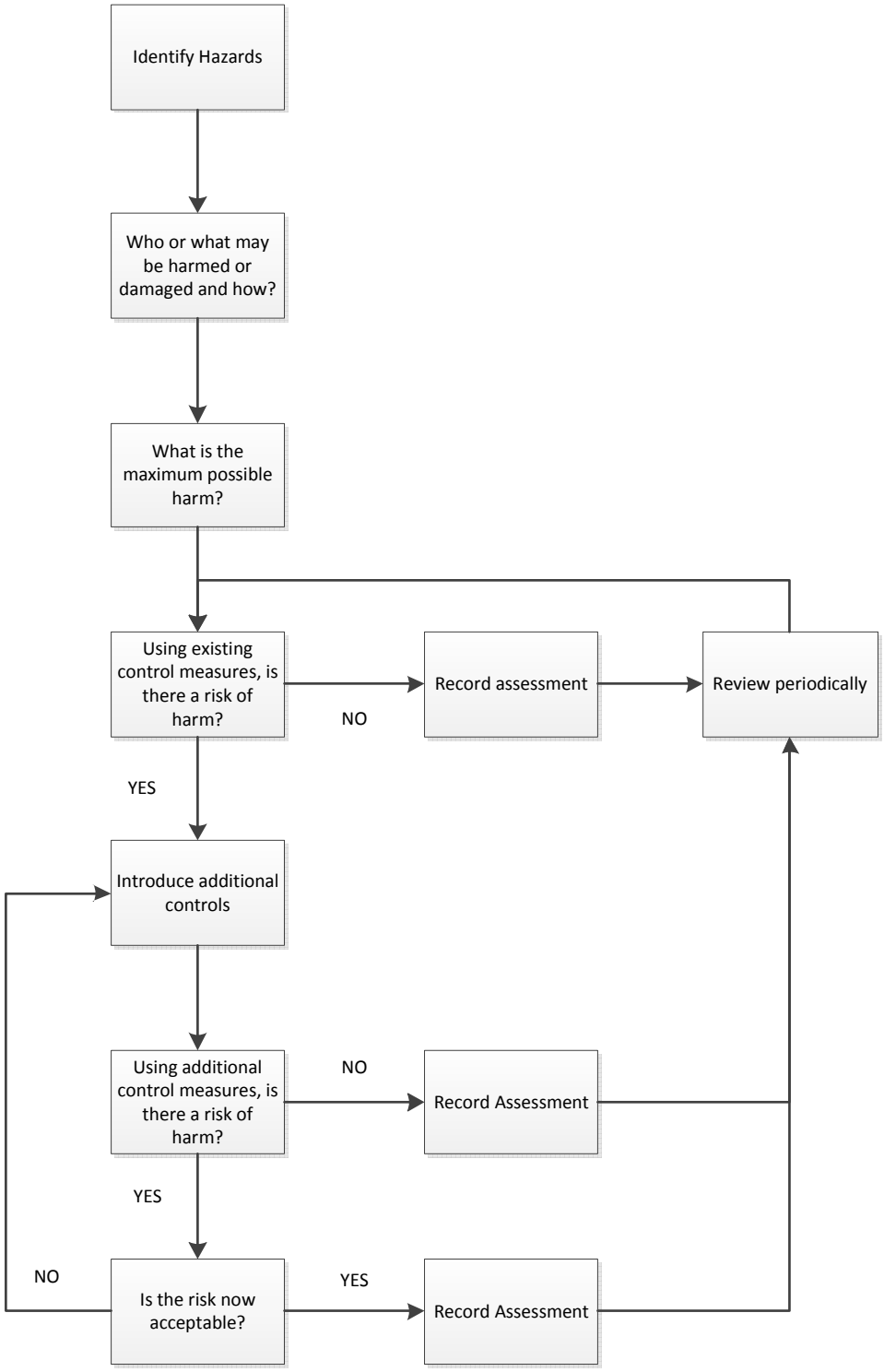
PPE is important where the nature of the work precludes engineering solutions. General laboratory work will require laboratory coats, gowns, gloves and eye protection, and lone workers (in and out of the permanent workplace) may still require mobile phones and personal alarms, but all measures determined will include requirements to train in proper use and the development of safe working practices.

Step 5 Review

It is good management to review risk assessments periodically as assurance that the control measures determined are still valid. The frequency of review can be determined on the basis of hazard and risk, but an annual review of laboratory or COSHH assessments could be appropriate. Risk assessments should also be reviewed and revised as necessary whenever changes to procedures are proposed or have occurred.

Diagram 1 **Approach to risk assessment**

Note: this flow chart can be referred to whilst reading this section and retained as an *aide-memoir.*



Application of principles to work activities and tasks

This guide can be used as an introduction or a companion to specific guidance on topics where risk assessments, general or specific, are required.

Examples are:

Laboratory hazards (Guidance Note 4 of this document)

Manual handling

Display screen equipment

Driving

Travel

Working alone

Other documents will provide additional guidance to inform your risk assessments and your control measures.

Appendix 2. Risk evaluation and proportionality employing a matrix-based approach

Risk evaluation

Risk evaluation is the process of estimating the likelihood of an event occurring, such as exposure to a biological agent, plus identifying the likely consequence of that exposure. This can be represented by a risk matrix. A matrix gives a final risk ranking which results in prioritising of risk. This ranking allows the introduction of an action plan that applies risk control measures for the highest risks first of all as part of an overall process for reducing the exposure to risk.

Matrices can be constructed using any chosen number of categories on each axis, i.e., 3 x 3, 4 x 4, or 5 x 5, etc, or even 3 x 4, etc. The MRC has chosen to use a 4 x 4 matrix for risk management and research continuity for example, so this guidance is consistent with that approach.

Risk Ranking (how big is the risk) =

Potential <u>severity</u> of harm x the <u>likelihood</u> of the event occurring

Many like using a semi-quantitative or qualitative matrix to gain a picture of the potential for harm. We can start by applying key phrases to Likelihood and Severity.

Likelihood		**Severity**	
1.	Highly unlikely	1	Slight harm
2.	Possibly	2	Injury affecting work (but not RIDDOR reportable)
3.	Quite likely	3	Serious injury (RIDDOR reportable)
4.	Very likely	4	Possible fatality

Then we can transpose this onto a matrix, using the product of the numbers.

The objective is to link the level of risk (as placed on the matrix) with an action. The following matrix links together a numerical score, a brief description of the possible outcome and the proposed action.

The matrix will determine your action plan. In this matrix anything with a risk factor of 9 or more is deemed unacceptable, 6-8 requires prompt attention (significant), 3-5 should be reduced as soon as resources permit (tolerable) and 1-2 are deemed insignificant.

The aim of the risk assessment process is to move the risks toward the bottom left as much as possible. All assessments should be seen in context, so it will be very rare for you to start anywhere near the top right ("Very likely possible fatality") in the laboratory situation and hopefully never in an office location.

The assessor must always apply a sense of perspective and proportion. There will always be cases on the borderline and in those situations you should look at all factors affecting the work (risk, competence, alternatives, etc) and decide on the appropriate course of action.

For the most part, for MRC activities we are trying to move from Significant down to Tolerable or even Insignificant if it is reasonable to do so.

	Severity			
Likelihood	**4** Tolerable Very likely, Slight harm	**8** Significant Very likely, Injury affecting work	**12** Unacceptable Very likely, Serious injury	**16** Unacceptable Very likely, Possible fatality
	3 Tolerable Quite likely, Slight harm	**6** Significant Quite likely, Injury affecting work	**9** Unacceptable Quite likely, Serious injury	**12** Unacceptable Quite likely, Possible fatality
	2 Insignificant Possibly, Slight harm	**4** Tolerable Possibly, Injury affecting work	**6** Significant Possibly, Serious injury	**8** Significant Possibly, Possible fatality
	1 Insignificant Highly unlikely, Slight harm	**2** Insignificant Highly unlikely, Injury affecting work	**3** Tolerable Highly unlikely, Serious injury	**4** Tolerable Highly unlikely, Possible fatality

The guide for an action plan should be very simple:

For example:

Unacceptable	– Red	- Stop, or do not commence, until improvements are made, including the option to use alternative methods or substances of lower hazard
Significant	- Orange	- Proceed with caution but improvement is high priority. Revisit the procedure to either lower the hazard or improve risk control
Tolerable	- Yellow	- Proceed but plan to improve
Insignificant	- Green	- Any improvements low priority

Guidance Note 3 - Area based risk assessment

Option 1

An area-based approach to risk assessment is particularly useful for less complex and **lower risk areas** (e.g. offices and common areas) where separate detailed assessments for all workplace hazards are not warranted.

Option 2

The approach can also be useful however to collate **procedural** assessments for one area in order to establish the control measures, both engineering and personal protective equipment, collective and individual, that are required throughout the area. This should prove useful and beneficial for general purpose laboratories where work is done for example with hazard group 1 biological agents including Class 1 GM activities, small amounts of radioisotopes and chemicals of lower hazard. Guidance on procedural assessments in laboratory areas is included as **Guidance Note 4**.

The template provided in **Appendix 3** (freely adapted from that created by the University of Reading) is designed for both purposes.

Use of template

Basic information

For record purposes each assessment must have a unique reference number. Persons at risk can be generic rather than individual, e.g. 'room occupants', 'visitors', 'contractors' etc.

Section 1

Brief scanning of this table will assist you to identify workplace hazards and a tick can be included against each of these categories. You can tailor the boxes to suit your needs. One box is included for 'others', but in the rare case where there is more than one significant 'other', you can replace an existing box or boxes with your own. Using an office as an example of Option 1, you may typically place ticks in boxes 3, 4, 5, 6, 7, 8, 10, 15, 24, 26, 27 and 29.

Section 2

For **Option 1** (lower risk areas), you should use one row per hazard identified in Section 1. The row includes provision for a brief description of the hazard and what you have in place to reduce any perceived risk. The categories of risk level match the matrix described in **Appendix 2**. If you judge you should or could do more, the next column should include additional measures required. Finally, there is room for a procedural reference number. You can adapt this for any cross-referral system you have. In an office, an example of using this route would be identifying hazard 5 (DSE) and then referring to individual DSE assessments via the final column.

For **Option 2**, including laboratories, in addition to the 'one row per hazard' approach for the more straightforward hazards, you can also choose to use 'one row per procedure' or 'group of procedures'. In these situations, the Hazard No. can include more than one hazard, for example 15, 20, 21 and 22 may all be used for one procedure. The second column would then include a brief title of the procedure rather than the hazard(s).

Each procedure can be assessed using the template in **Guidance Note 4** or similar. A summary of the control measures can then be inserted and the risk level established and

finally any additional measures required can be inserted together with the reference to the procedural assessment.

What can be gained from this approach

There are two key purposes:

1. To save effort

The approach should benefit those charged with assessing risks in low risk areas, where one summation sheet is all that is required, possibly together with very few specific assessments (e.g. offices and DSE). It provides the evidence that hazards and risks have been identified and controlled.

2. To ensure all those potentially exposed are considered and ensure a more holistic approach

This applies mainly to laboratory areas where several procedures may be done by several groups. By collating the procedures and considering all the hazards together, the most hazardous procedure (where there is one) can be determined and this will determine the collective and individual measures required for each area, irrespective of which procedure each individual is carrying out. This will include the wearing of PPE such as eye protection and laboratory coats.

The main tasks will still be the individual procedural assessments and specific assessments where identified as necessary by the procedural assessments. Completing the area assessment will then be comparatively simple but potentially valuable and rewarding.

Area Health and Safety Risk Assessment Form **Appendix 3**

Assessment No.		**Area or activity assessed:**	
Assessment date			
Persons who may be affected by the activity (i.e. are at risk)			

SECTION 1: Identify Hazards - *Identify if any of the hazards listed below are significant (tick the boxes that apply).*

1.	Fall of person (from work at height)		**6.**	Lighting levels		**11.**	Use of portable tools / equipment		**16.**	Vehicles / driving at work		**21.**	Hazardous fumes, chemicals, dust		**26.**	Occupational stress	
2.	Fall of objects		**7.**	Heating & ventilation		**12.**	Fixed machinery or lifting equipment		**17.**	Outdoor work / extreme weather		**22.**	Hazardous biological agent		**27.**	Violence to staff / verbal assault	
3.	Slips, Trips & Housekeeping		**8.**	Layout , storage, space, obstructions		**13.**	Pressure vessels		**18.**	Fieldtrips / field work		**23.**	Confined space / asphyxiation risk		**28.**	Work with animals	
4.	Manual handling operations		**9.**	Welfare facilities		**14.**	Noise or Vibration		**19.**	Work with lasers		**24.**	Condition of Buildings & glazing		**29.**	Lone working / work out of hours	
5.	Display screen equipment		**10.**	Electrical Equipment		**15.**	Fire hazards & flammable material		**20.**	Radiation sources		**25.**	Food preparation		**30.**	Other(s) - specify	

SECTION 2: Risk Controls - *For each hazard identified in Section 1, complete Section 2. Reference should be made in each row to corresponding procedural assessments*

Hazard No.	Hazard Description (or Procedural Description in higher risk areas)	Existing controls to reduce risk	**Risk Level** (tick one) (can be used with matrix)				Further action needed to reduce risks *(provide timescales and initials of person responsible for action)*	Proc ref No.
			Unacc	Sig	Toler	Insig		

Health and Safety Risk Assessments – continuation sheet

Assessment No.	
Continuation sheet number:	

SECTION 2 - continued: Risk Controls

Hazard No.	Hazard Description	Existing controls to reduce risk	**Risk Level** (tick one) (can be used with matrix)				Further action needed to reduce risks *(provide timescales and initials of person responsible for action)*	Proc ref No.
			Unacc 11-16	Sig 8-10	Tol 4-7	Insig 1-3		

Name of Assessor(s)	**SIGNED**	Number of continuation sheets used:	
Review date			

Guidance Note 4 - Procedure based risk assessment for laboratories

Starting point

Ideas for novel research develop first into outline procedures. Once these procedures are drafted, which could include the use of hazardous substances, then is the time when the procedural risk assessment should be done.

If the hazardous substance is chemical in nature, risk assessments for COSHH, based upon information within the material safety data sheets (MSDS) and the context of the work will determine the risk controls required as defined in the regulations. The properties of individual hazardous chemicals must be determined, as in some cases a single chemical of high hazard will determine the overall control measures for the procedure.

Consideration of the use of biological material and animal allergens should always have been included within COSHH assessments, but regrettably that is rarely done. You must consider them however within the procedural assessment.

COSHH assessments will not however identify if additional measures are required if the procedure includes work with radioisotopes. In these cases, the procedural assessment must include this aspect.

It is also sensible to include other hazardous properties of chemicals not included in COSHH, e.g. flammable, explosive, asphyxiant, liquefied gases.

This document takes you through the process of a procedural risk assessment. It does not preclude the need to consider each substance, but you should be aware that the law only requires you to record the details of an assessment where there is a significant risk. You still however must make a record of the fact that you have considered all the hazards and risks before coming to the conclusion that a detailed record is not required. Procedural assessments can be used to effect as a means to that end, especially in areas of low overall hazard and risk.

It may be possible to consider all the procedural assessments made for a particular area and collate the findings to produce a risk assessment for that area. Other factors contributing to area assessments are considered later.

1. Hazardous substances

A hazardous substance is defined under the COSHH Regulations as:

1. Any chemicals which require labelling as harmful, irritant, corrosive, toxic or very toxic under existing packaging regulations.
2. Chemicals for which an occupational exposure standard or maximum exposure limit has been set by the Health and Safety Commission, mainly volatile substances.
3. Biological agents (including pathogenic organisms)[2].

[2] A 'biological agent' is defined within **COSHH** as "*any micro-organism, cell culture, or human endoparasite, including any which have been genetically modified, which may cause an infection, allergy, toxicity or otherwise create a risk to human health*".

4. Dust of any kind when present in substantial quantity in air.
5. Then there is a catch all which sweeps up all other substances giving rise to an equivalent risk to health. This would include some substances used for or being products of genetic manipulation activities and also allergens.

2. Genetically Modified Organisms (GMOs)

Risk assessments made under the Genetically Modified Organisms (Contained Use) Regulations 2000 do not have to be repeated. They may contribute significantly however to the total assessment, especially as they also include consideration of the environment, not included in COSHH.

3. Reproductive hazards

The use of substances that are known or suspected to be toxic for reproduction poses particular questions with respect to risk assessment. In addition the Management of Health and Safety at Work Regulations 1999 require employers to address specifically the risks to health at work of new and expectant mothers. Guidance on work with reproductive hazards can be found in MRC Reproductive Hazards, Carcinogens, and Mutagens Best Practice Guidance.

4. Ionising Radiation

This document does not cover all aspects of compliance with the Ionising Radiations Regulations 1999. It recognises however that the hazards and risks of using unsealed sources of ionising radiation in the laboratory cannot be viewed in isolation.

Application of the five steps in procedural assessments

Step 1. Hazard identification

The hazardous properties of most laboratory chemicals will already be known through knowledge and experience. You can glean additional information from labels, material safety data sheets and databases. The principal source of information on biological agents is the Advisory Committee on Dangerous Pathogens (ACDP) publication 'The approved list of biological agents', which has legal status within COSHH. Analysis of the hazards of ionising radiation should consider not only the nature of the radiation (i.e., alpha-, beta- or gamma) but also the physico-chemical nature of the radioactive substance (e.g., vapour, volatile liquid, toxic compound, etc.).

Chemical hazards	**What quantities are you using?** Work involving **small quantities** of most chemicals and carried out under **good laboratory practice** in a properly equipped laboratory should not lead to significant exposures. However, work involving any amount of **very toxic or reactive chemicals may require further controls to prevent exposure**.
Quantity and Reduction	Large quantities of less toxic substances (e.g., those labelled **harmful** or **irritant**) can present significant risks in the laboratory. The risk assessment should take account of this. Other examples are flammable liquids and some explosive compounds. Can you reduce the volumes required?
Toxic or harmful chemicals	**Pictograms** Until 2009 hazardous chemicals have been labelled with one or more of the following pictograms placed on the left of each pair. These will still be encountered for a few years (from 2010). The pictograms on the right are representative of the new symbols that you will be encountering from now on under the EU Classification, Labelling and Packaging regulations. Gradually new hazard statements and precautionary statements will take over from risk and safety phrases, but this will take some years to develop. The rest of this document retains the old symbols and phrases.  **Very toxic, Toxic**  **Harmful, Irritant**  **Corrosive**  **Explosive**  **Oxidising**  **Extremely, Highly flammable**  **Dangerous for the environment**  **Example of new pictogram for long term effects, e.g. sensitisers, carcinogens, etc.**
Hazardous properties **Carcinogens, mutagens and substances toxic for reproduction**	**Higher hazard – potentially higher risk** Under each of the **groups** of hazardous chemicals listed below in the left column we have identified **subgroups** of, or **individual**, substances which **may** pose a particular risk if exposure occurs even on a laboratory scale. You should check if appropriate procedures are set out already in local codes of practice. By their very nature, there is no absolutely safe amount of these compounds to work with. As a rough guide however the **more hazardous** compounds in these groups will be **marked with the toxic symbol**, the less with the harmful symbol (see also following page). **More hazardous** includes **category 1 and 2 carcinogens, mutagens** and **substances toxic for reproduction** and are defined as **toxic**. All category 3 compounds are identified as harmful.

Toxic chemicals	**Risk numbers and phrases** The numbers/phrases given below are those that characterise the more hazardous chemicals. Most of these will be labelled with the toxic rather than the harmful symbol. They are as defined in packaging regulations and are also used in chemical catalogues and data sheets to convey hazard information. The most significant ones for each substance will also be found on bottle labels. Special attention should be given to combinations of numbers/phrases: e.g**.,** ***R 39/24*** *- Toxic: danger of very serious irreversible effects in contact with skin.*[3]	
	R23 Toxic by inhalation **R24** Toxic in contact with skin **R25** Toxic if swallowed **R26** Very toxic by inhalation **R27** Very toxic in contact with skin **R28** Very toxic if swallowed **R29** Contact with water liberates toxic gas **R31** Contact with acids liberates toxic gas **R32** Contact with acids liberates very toxic gas **R33** Danger of cumulative effects **R39** Danger of very serious irreversible effects **R40** Possible risks of irreversible effects	**R41** Risk of serious damage to eyes **R42** May cause sensitisation by inhalation **R43** May cause sensitisation by skin contact **R45** May cause cancer **R46** May cause heritable genetic damage **R47** May cause birth defects **R48** Danger of serious damage to health by prolonged exposure **R49** May cause cancer by inhalation **R60** May impair fertility **R61** May cause harm to the unborn child **R62** Possible risk of impaired fertility **R63** Possible risk of harm to the unborn child **R64** May cause harm to breast-fed babies
Corrosive substances	Some chemicals are particularly corrosive and may require specific measures in the laboratory, especially if there is a spillage. Examples are: **Hydrofluoric acid** **Bromine** **Phenol**	
Highly reactive chemicals	Some categories of chemicals are potentially highly reactive. These include: **Explosive compounds** **Powerful oxidising agents** **Peroxidisable solvents** **Azides or perchlorates** **Other highly unstable compounds**	

[3] Risk and safety phrases are being replaced by Hazard and Precautionary Statements under the new EU (Global Harmonisation Standards – GSH). For full list, go to http://www.fisher.co.uk/about_us/clp.php

Corrosive substances	Some chemicals are particularly corrosive and may require specific measures in the laboratory, especially if there is a spillage. Examples are: **Hydrofluoric acid** **Bromine** **Phenol**
Highly reactive chemicals	Some categories of chemicals are potentially highly reactive. These include: **Explosive compounds** **Powerful oxidising agents** **Peroxidisable solvents** **Azides or perchlorates** **Other highly unstable compounds**
Biological hazards	Work with biological agents is subject to risk assessment under COSHH. Unlike assessing work with many chemicals, there is no threshold and generally you are working with agents with the ability to replicate in the right conditions. Assessment of risk can therefore be more subjective and complex in some cases.
Human or human-derived material	You should establish as much as you can of the history and background of any human tissue, cell-line etc. Is the material likely to or known to be infected? Is its origin known? If a cell-line, is it well characterised?
Pathogenic organisms	Are you intending to work with a known pathogen? If so you will be able to check on which hazard group it belongs to determine the proper containment conditions required.
Animals	The animals themselves can be the source of hazardous substances in the form of allergens. If members of your team are working with animals they must (a) be trained and (b) be registered for monitoring by your occupational health service provider. Other concerns may relate to the species (e.g. primates) and to the intended procedures (e.g., does the project involve administering toxic substances, infective agents or radioactive substances to the animals?).
Genetic material	For registered laboratories, any risk assessments approved by local ACGM biological safety committees relating to the project can contribute to the risk assessment and need not be repeated.
Ionising radiation	Exposure to radiation can be controlled by the application of good practice and adherence to local rules. However, work proposed to be done in controlled areas, including work to be done according to a written system of work, may require more detailed assessment. You must however follow the steps prescribed in the IRR regulations; namely, **Justification** (you must be able to justify the use of ionising radiation. This is the equivalent of elimination – or do I have to do it this way? – in the hierarchy of control), **minimisation** (keeping all quantities to the minimum required) and **distance** (ensuring the distance between you and the source is maintained to minimise potential exposure).
Other hazards	Is the work likely to generate high concentrations of dust? If so your assessment should consider ways of preventing exposure to the particles.

Step 2. Who may be exposed?

The actual proposed location for the work can have particular significance, for example where specialised facilities are required such as a category 3 laboratory or a chemical laboratory. The following asks three key questions.

The people and place	**Where is the work to be done?** Do you propose to use your own laboratory only or are specialised facilities required? Your risk assessment will decide if the facilities are adequate for carrying out the work. **Who will be doing the work?** There are two major things you should bear in mind throughout the assessment. First, are your staff fully trained and competent to do the work? This is especially relevant where the use of specialist facilities or equipment are concerned. There may also be stages in the process where staff who are not members of your team are involved and who may be vulnerable: the stores person receiving the goods, the autoclave operator, those disposing of the waste including that which is radioactive or biological services staff administering substances to animals on your behalf. Their own line managers should ensure they are trained and that their own work is assessed, but it is likely that you should be providing them with additional information. This should include a copy of your risk assessment, highlighting the points at which they may be at risk (subject to the appropriate control measures being in place). Secondly, is there any reason why the member of staff might not be able to do the work or might be affected by the work? Examples might include (a) someone suffering from an allergy (e.g., to latex, to animal allergens or to specific chemicals), (b) an expectant mother, (c) a young person or (d) a person with a disability, be it physical or a learning difficulty. **Will anyone else be affected by the work?** Many labs host more than one working group. Can people working on the other side of a bench be affected by your work? An example could be if significant quantities of ^{32}P are being used and shielding is only in front of the operator. You should also consider the possibility of other people, e.g., maintenance or contract staff, entering your work area. Do you need special rules, work permits, training, etc.? Consideration of additional potentially vulnerable groups is included in the preceding paragraph.

Step 3. What is the maximum exposure and what is the risk?

Initially you should assume no control measures are in place and assess the potential exposure before deciding on the control measure. Thus, for example, for a neurotoxic powder you should think at this point of the maximum amount to be handled at once and on the basis of the known data decide in the following step (Step 4) if a fume cupboard, additional PPE or other measures are required.

It is correct however that judgement is tempered by previous knowledge and experience. In actual fact you probably already have a fume cupboard and may have a local code that stipulates that all such compounds are handled in a fume cupboard. Even so, this is the stage where you should note the scale of your proposed operation and the significant risks of harmful exposure in the absence or failure of control measures.

With respect to the latter, in most situations this begs the question "what could be the exposure if things go wrong?" either through the failure of a control measure or a catastrophic event. A flask containing a human pathogen culture is a primary containment measure. What happens if it falls to the floor? Is it breakable? A fume cupboard is a

control measure. What happens if it fails? Is there a risk? Your control measures should address as many "What if?" questions as is reasonably foreseeable.

Evaluation of risk

Is there a risk to health?

The assessor must consider the ways by which exposure to the hazards could cause harm. This includes identifying the possible routes of exposure, limiting the quantities used and reviewing the current measures for controlling exposure.

If the current measures are adequate, then the assessment is complete. Judgement on the current measures of course depends upon an understanding of the route and extent of exposure and the capabilities of the current control measures. The following can aid an appraisal of your current measures. If further measures are required however they must be specified through further assessment.

Step 4. Risk control

Elimination

Your first option must always be to consider the possibility of not doing the procedure at all – or at least not in the proposed manner. If the initial risk assessment suggests the risks are too great, i.e. are unacceptable or even significant, using the matrix approach, it may be possible to radically rethink the procedure, using less hazardous techniques or substances.

It may be that your laboratory and/or personnel does not have the facility, equipment or competence to do the specified tasks. One option for elimination of risk in those circumstances would be to contract out the task to others or to do the task in suitable facilities elsewhere.

Substitution

Your second option must be to consider the possibility of substituting a less hazardous substance, process or specific technique. This may include the substitution of:

- A less toxic chemical
- A less volatile or flammable solvent
- A different form of the same chemical (e.g., pre-dissolved solutions of acrylamide)
- An attenuated for a virulent strain of a pathogen
- Avoiding the use of radioactive isotopes altogether, or –
- Substituting a less hazardous isotope where scientifically appropriate (e.g., ^{33}P for ^{32}P).

Any decision on substitution can only be made following identification of the significant hazards and evaluation of the risks but you should bear the possibility in mind throughout the process. Should you identify a less hazardous but scientifically equivalent option, you are bound to use it, unless you can justify otherwise. Factors that you are permitted to consider are the quality of results and the cost of changing protocols, etc. You may have to accept however, that the safety case is so overwhelming that the change must be made.

Determine appropriate controls

If you cannot substitute less hazardous substances, you must implement measures that prevent or minimise exposure to risk. These measures will reflect the route or routes of possible exposure. Where the airborne route is the significant contributor, risk control measures to be considered would include the use of a fume cupboard (chemical) or a safety cabinet (biological). If the substances are hazardous through ingestion, then the main measure is likely to be through good laboratory hygiene. Finally if absorption through the skin or via a skin puncture could result in harm, the use of sharps would be avoided or minimised and some form of skin cover would be necessary, mainly through hand and face protection.

In practice a combination of all three is likely. You are required to prevent or minimise exposure according to a hierarchy of measures. Full guidance can be found in the ACoP to COSHH but the following table briefly summarises the requirements:

Risk control measures

Preference not to use PPE	The over-riding requirement is that wherever it is reasonably practicable, adequate control of exposure should be achieved by means other than the use of personal protective equipment (PPE).
First considerations	Control of exposure can be achieved by any combination of methods but the preferred order is:
1. Elimination	Does the procedure have to be carried out at all? (It may be possible to radically rethink the project if the risks are too great – or if further thoughts reveal a lack of suitable facilities)
2. Substitution	Can you replace any or all of the hazardous entities with something less or non hazardous? (Can you use an attenuated rather than a virulent strain of a pathogen? Or a disabled strain rather than a wild-type? Or a non-carcinogen instead of a carcinogen?)
3. Reduction	Is it necessary to conduct the procedure at the proposed scale? Can you reduce the quantities used or limit the frequency of the procedure?
4. Engineering controls	• **total enclosure** (e.g., glove box, flexible film isolators, Class III safety cabinet) • **partial enclosure** (e.g., fume cupboard, Class I or II safety cabinets) • **local exhaust ventilation** (e.g., exhaust ducting from machine tools, soldering or welding operations, some laboratory equipment) • **sufficient general ventilation** (e.g., animal rooms or containment laboratories, often linked in with measures taken in the first two categories)
5. Additional measures	• **good work practices** and hygiene standards • **use of PPE** (including re-usable respiratory protective equipment – RPE).
When can and must you use PPE?	The use of **appropriate PPE** (e.g., laboratory coats, eye protection, gloves or gauntlets, or respirators) is however the approved method of choice in many circumstances where the use of engineering controls is not reasonably practicable or indeed necessary. In these circumstances it is important that the PPE is used appropriately and its use enforced by local management.

There should be little or no need to change existing good working practices. In summary, your judgement on the risk control measures necessary should be based on the following:

- What are the known and potential hazards;
- What are the likely routes of exposure;
- Whether a less hazardous substance or process can be substituted;
- Minimising or limiting the amounts handled;
- Using a fume cupboard or other containment measures for dusts or volatile substances (including volatile radioactive substances);
- Using microbiological safety cabinets for hazardous biological work;
- Wearing appropriate gloves for substances absorbed through the skin;

- Wearing appropriate eye protection unless the assessment concludes it is not necessary;
- Avoiding wherever possible the use of sharps;
- Using appropriate shielding and remote handling devices for work with radioactive isotopes;
- Maximising distance and minimising time for work with radioactive substances;
- Using correct waste disposal routes and measures;
- Assessing the potential for accidental exposure and implementing emergency procedures;
- Staff training and competence;
- Occupational health requirements (including the keeping of records).

Examples where record keeping is required include those working with hazard group 3 or 4 pathogens or Class 3 and 4 activities with GMOs and classified workers with ionising radiation.

Additional controls

Risk assessment of the actual work practices will be straightforward in the majority of situations. The total context of the work however includes issues which may appear to be peripheral but must be an integral part of the assessment. Three main additional factors should be included in any assessment.

Purchasing and Storage	You should consider at this stage the quantity you need and the facilities required to store the material. For chemicals, you should not buy more than you need, since this will increase the costs of disposal. Special conditions may also be required, e.g., ventilation and security. You should take care not to store incompatible chemicals close to each other. For biological agents, containment facilities are required even for storage.
Waste disposal	New work may require specialised waste disposal. You may require an autoclave, a waste solvent store, waste radioisotope storage facilities, etc.
Emergency procedures	Your assessment should check whether your current arrangements are satisfactory. General laboratories will require spillage kits and containment laboratories a disinfection protocol.

Placing the work in context

This document focuses on the hazardous properties of substances and managing the risks associated with working with these substances. You should however always think of the work in a broader context. Does the work for example require prolonged periods in one position or environment (e.g. at a display screen, or microscope, or working in a cold room)? Could the work involve a requirement for manual handling? Are there physical hazards associated with using pieces of equipment (e.g., a centrifuge, a microtome or a machine tool)?

Workplace monitoring and health surveillance

The risk assessment may identify a requirement for monitoring of the workplace and/or surveillance of the health of employees. For example, environmental monitoring for airborne allergens in an animal facility can evaluate the effectiveness of local exhaust ventilation and greatly inform decisions on the wearing of respiratory protection equipment. For laboratory work however the need for workplace monitoring is likely to be exceptional, other than for work with radioactive isotopes. The Corporate Health, Safety and Security team should be consulted over any decision to adopt workplace monitoring.

Note on the maintenance of control equipment.

Engineering control measures must be properly maintained and tested on a regular basis. The most likely laboratory equipment to come into this category would be fume cupboards, microbiological safety cabinets and flexible film isolators but similar provisions may need to be made for whole room ventilation systems, e.g. in carcinogen suites or containment laboratories.

It is likely that the responsibility for ensuring equipment is maintained properly and tested is delegated to an individual member or members of staff. You can however find required testing frequencies for most engineering controls in our documents on Record Keeping and Working with Biological Hazards.

Where you have determined the need for re-usable RPE (e.g., airflow helmets), these must be examined and tested every 3 months.

Once you have decided on the risk control measures, your final question should be "**Is there still a risk to health?"** In the majority of situations the answer will be **No** and the assessment is complete. In some situations, the answer may be **Yes**. An example may be the use of a hazard group 3 pathogen, where the possibility of infection still exists despite the measures specified. Here the appropriate question is "**Is the residual risk acceptable?"** If so the assessment is complete. If not, the assessment must be reviewed and additional control measures introduced before acceptance.

Recording the assessment

It is highly likely that the results of your assessment will indicate that your existing laboratory codes of practice or operating procedures can be applied to your project. If a previous assessment or current code of practice does not cover the work, details should be entered in the record of the control measures required.

The ownership of completed forms can be through the signature of the team leader and dated, with provision for further signing at the time of review, or within an electronic record where ownership is identified. Where more than one team is using similar substances in similar procedures teams may wish to 'adopt' assessments made for another team. A copy of the assessment should always be available in each defined area where the work is done.

Step 5. Monitoring and Review

Monitoring

Monitoring is necessary to meet two main objectives. The first is to ensure compliance in the implementation of all the control measures identified as necessary through the risk assessment. If your assessment is suitable and sufficient for the work then each identified control measure is necessary to prevent or control exposure to risk. Compliance is therefore both necessary and a legal requirement.

The second objective is to ensure that the resultant procedures continue to be appropriate. The review process, discussed below, with provide a point of reference to decide if the

assessment remains valid, but regular monitoring can identify problems in the interim period.

Review

You should review all of your risk assessments regularly and whenever there is cause to believe it is no longer valid. For most work the recommended review interval is one year.

Taking responsibility

The task of making risk assessments can be delegated to any competent member of the team but identified team leaders are required to take responsibility for ensuring the risk assessments are made for their team and are suitable and sufficient for the work. Thus team leaders are required to sign each form at the time of creation and at subsequent review.

Appendix 4. Template for laboratory procedural risk assessment

RESEARCH TEAM LEADER ……	**ASSESSOR** (where not team leader) ……
TITLE OF PROJECT OR PROCESS	

TECHNIQUE(S)	**FREQUENCY**	**LOCATION OF WORK**

HAZARDS IDENTIFIED
(In Hazard column specify CHEMICAL, BIOLOGICAL AGENTS, HUMAN/ HUMAN DERIVED MATERIAL, ANIMALS, RADIOISOTOPES and/or OTHER as appropriate)

Substance/Agent	**Hazardous properties**	**Quantity**

WHO MAY BE EXPOSED?

WHAT IS THE MAXIMUM POTENTIAL EXPOSURE?

METHODS OF PREVENTION OR CONTROL OF EXPOSURE

Access control	a)	restrictions to competent personnel*	☐
	b)	containment laboratory	☐
	c)	controlled area	☐
Engineering controls	d)	total containment	☐
	e)	fume cupboard, or safety cabinet	☐
	f)	local exhaust ventilation	☐
Approved PPE	g)	gloves, etc. (specify type _____)	☐
	h)	eye protection	☐

	i)	other PPE (specify _____)	☐
Special procedures	j)	SOP required	☐
	k)	Code of practice, local rules, etc.	☐

***Named personnel** _____ _____

_____ _____

ASSESSMENT OF EXISTING CONTROLS

(You should state here if the existing available risk control measures are sufficient to cover this work. If the work requires a specific code of practice, its identity should be written here. This may also identify the need for a new CoP, or the need for an SOP)

TRAINING REQUIREMENTS (List all specialised training required before work can commence)	**STORAGE REQUIREMENTS** (Note any special requirements, e.g., ventilation, incompatibility, etc.)
EMERGENCY SPILLAGE (Describe procedure – cross refer if appropriate)	**WASTE DISPOSAL ARRANGEMENTS** (List **all** waste routes/packaging/arrangements to be used)

DECLARATION

The information on this form is accurate, to the best of my knowledge. All persons conducting this project have been thoroughly instructed and trained in the work and are competent to carry it out. When implemented, the selected control measures will ensure that any exposure to risk is not significant.

Signed: _____ (Team leader) **Date:** _____

This assessment was made for and by another group. Our group will use the procedure in an equivalent manner and the declaration above applies equally to our work/project.

Signed: _____ (Team leader) **Date:** _____

Review	**Date**					
	Signed					