

**Whose hands on your genes?  
The response of the Genetic Interest Group to the consultation  
document published by the Human Genetics Commission**

**1 Introduction**

- 1.1 The Genetic Interest Group welcomes the decision by the Human Genetics Commission to undertake this public consultation.

In formulating this response we have undertaken the following process in order to ensure that all our members have had the greatest possible opportunity to participate in forming the views expressed here in.

The consultative document was circulated shortly after its publication to all our members with a request that they let us know their initial reactions as quickly as possible. Comments received were incorporated into a draft response considered by the GIG Trustee Board at its meeting in January. A revised draft response was circulated to all members for comments and endorsement.

A second revision taking on board the views of members was debated by trustees of GIG at the board meeting on March 15th, where it was adopted as our response to the consultation document formally.

- 1.2 In our response we have followed the structure of the consultation document and structured our comments in response to the questions asked in each section. Given that some of these questions are broad in their scope this has inevitably created a degree of overlap. However this seems to be a clearer way of responding than continually cross-referencing to other parts of this response.
- 1.3 One issue that arises in many places is the appropriate form of consent to various forms of genetic testing and research. We have provided brief answers at each point. Note will undoubtedly be taken by the Commission of the extensive work already undertaken on this issue in recent years by a number of bodies. Should the HGC wish us to comment further on this as a specific issue we would be happy to do so.

**2 What is personal Genetic Information?**

- 2.1 *Is this a fair representation of what you believe personal genetic information to be? Is there anything else we should have added?*

Recognition of the diversity of sources that can contribute to genetic knowledge about individuals or families is important and timely. Such an understanding is needed to inform the debate about the appropriate uses of this data and the degree to which it needs to be regulated in novel ways not covered by existing controls. It is also important to communicate that most genetic variation between individuals is not pathological and that even in the minority of cases where this is not the case the outcomes often are neither inevitable nor necessarily major.

- 2.2 *Do you have different concerns over the use of the 3 different sources of genetic information (family history, external observable characteristics, analysis of blood or bodily tissue) outlined above and if so why?*

In many circumstances distinguishing between different “types” of genetic information would be artificial and inappropriate. A diagnosis of, for example, neurofibromatosis, on the basis of observation of dermatological events, is a genetic diagnosis just as surely as one made by means of a DNA test, and it has the same implications and consequences for the person and the family in whom the diagnosis is made. Rather than emphasising the method by which genetic information is revealed, emphasis should be placed on the content and the implications of that information and the uses that can be made of it.

At the level of the public understanding of genetics, medical and forensic uses of genetic information should be dealt with separately. Considering both together is likely to reinforce public perceptions about the assumed predictive power of genetic information. If a DNA sample can identify a criminal with almost absolute certainty, it may be assumed that it would also give similar precision in a clinical context. The reasons why this is not the case in most circumstances may not be well understood and will certainly need to be carefully conveyed.

It is clear, however, that links between medical and non-medical genetic data sets are possible. Already, medical bodies have felt the need to consider the implications of possible future police requests for access to DNA information contained in medical databases. This is a broad public policy issue, which raises considerations regarding people’s willingness to participate in research studies if they feel their confidentiality may be compromised, not to mention serious civil liberties issues.

- 2.3 *Should the HGC be concerned with all sources of personal genetic information or should it mainly focus on the new DNA technologies?*

The HGC should not concentrate on the application of genetic information derived solely from DNA diagnostic technologies at the expense of other routes. To do so could create a dichotomy that is often not justified, which could in turn create the possibility of unbalanced policy recommendations. It would also run the risk of reinforcing anxieties about new technologies that are not warranted by the underlying science.

### **3 Is Genetic Information Special?**

#### **3.1 *Is this a fair representation of the particular nature of genetic information? Is there anything else we should have added?***

This section of the consultation is written from the perspective that genetic information **is** special. It is GIG's view that whilst there may be specific applications of genetic information that require particularly sensitive handling, we do not believe that the general case has been made that genetic information derived from DNA analysis is so different from other forms of biomedical or familial information that it requires different treatment.

Clearly, a DNA test result may be important in triggering a course of action. In the future for example an understanding of the genetic basis of differential drug metabolism may lay the basis for a more individualised form of treatment. Today, diagnostic DNA sequence tests to determine whether or not a fetus is affected by a specific genetic condition can trigger a decision to terminate that would not follow from mere knowledge of family history. However, neither these nor other examples can be taken in and of themselves to imply that DNA information is special. In these circumstances all we can say is that DNA information is different, namely, more specific.

In other situations, a DNA diagnosis may not even be so different in its implications from other forms of genetic information. Consider three examples:

- 3.1.1 When the result of a DNA test is a predictor of future health—particularly for late onset genetic conditions such as Huntington's disease or the familial forms of breast cancer—it may well be of interest to employers, insurers or others in non-clinical contexts. But so, equally, would the knowledge of a family history of the same conditions. An individual's blood pressure, alcohol consumption, or the fact that they had diabetes or had been treated for cancer earlier in life might also be of equal interest. The main issue is whether or not access to such information is justified and if so under what circumstances. Furthermore, it must be emphasised that in most cases where a genetic disease manifests itself it is obvious at birth or in

childhood, and diagnosis is generally made on the basis of clinical symptoms, although it may subsequently be confirmed by DNA diagnosis.

- 3.1.2 Possible implications for family members of the uncovering of genetic information about an individual can raise difficult issues in clinical practice. But once again the problem is not restricted to information revealed by DNA analysis. If a person is symptomatic with Huntington's disease, for example, then a professional does not need to have access to DNA test results to know that a younger sister has a one in two chance of developing the condition and a one in four chance of having a child with the condition. In a different context, the knowledge that a person has a sexually transmitted disease or is HIV positive may be used to judge their relatives/partners adversely without genetics being implicated at all.
- 3.1.3 DNA is not the only biological molecule extracted from humans (or other species) or synthesised into a form identical to the naturally occurring state that may have commercial value and which may be subjected to patenting (para 3.2.5). Enzymatic preparations used in the treatment of metabolic disorders, hormones, stem cells and other biological substances raise many of the same issues.

These three examples raise a general concern GIG has with proposals that make a special case of DNA test information: singling out DNA risks obscuring the most important issue in each case. In the latter example, the important question should be the proper method for society to exploit the benefits of biomedical research for the benefit of human health. Or, consider genetic information derived from samples collected in the course of other investigations, another example given in the consultation document (paras 3.2.2. and 3.2.7). The key issue here should be the proper protection of individuals and the gaining of appropriate consent to the collection and use of any personal information.

- 3.2 *Do you think that existing legislation and codes of professional conduct provide a sound basis for the protection of human genetic information?*

GIG believes that existing frameworks provide a sound basis for the protection of human genetic information, though they may need to be extended in certain circumstances, for example in respect of the impact on the family of certain types of genetic information. Unfortunately there appears to be a widespread perception that there is actually little or no regulation in place. Efforts should be made to raise awareness of what is currently in operation before rushing to introduce new regulations in the absence of a genuine need to do so, or simply as a response to a perceived public anxiety.

- 3.3 *Does the protection of the confidentiality of genetic information require special consideration or should it be treated in the same way as any other form of personal medical information?*

With the exception of one Trustee, the GIG Trustee Board and the GIG members who responded to our consultation believe that genetic information is adequately protected by existing regulations on the disclosure of personal medical information. So long, that is, that the implications of genetic information to the family are considered, and existing regulations are properly enforced.

## **5 Personal Genetic Information in medical practice: consent to testing.**

- 5.1 *Is this a fair representation of the consent issues in genetic testing? Is there anything else we should have added?*

A central requirement for any genetic data collection in medical practice, whether by DNA analysis or other means, is the informed consent of the subject, or if he or she is incapable of giving that consent and the collection of the genetic information cannot be postponed until they are in a position to be able to give consent themselves, then the consent of a parent, guardian or other legally appointed person on behalf of the subject. This consent should follow a clear explanation of the range of purposes for which the samples may be used. Consent should be gained for new uses of old samples, in so far as this is possible.

It is difficult to make generalisations with respect to situations where patients themselves are not able to give informed consent—such situations are probably best resolved on a case by case basis, bearing in mind the nature of the procedure proposed and the possible implications for the individual and for others of the information that may be revealed. Provided generally accepted standards of good practice are followed, there seems to be no **a priori** reason to assume that those incapable of giving consent would act as a class in ways significantly different from those able to give their consent.

With regard to the testing of children, GIG produced a paper on this that arose as a response to the report of the Clinical Genetics Society (now a constituent member of the British Society for Human Genetics). A copy is attached to this response. In essence, there was much common ground with the CGS. Testing can be important for confirmation of diagnosis or proper clinical management of an existing condition. Pre-symptomatic testing for childhood-onset conditions can aid early monitoring by professionals and practical preparations by parents. Both the CGS and GIG argued that testing during childhood for adult onset conditions was in general wrong, unless an early

medical intervention was possible, since this would remove the chance for the person to make an informed choice themselves about whether or not to test when they became an adult. The one area of disagreement concerned testing during childhood for carrier status. In general the CGS opposed this, while GIG could see why it might be appropriate in some circumstances and felt the decision was best left to the parents (for a discussion of this particular issue see Childhood testing for carrier status: the perspective of the Genetic Interest Group, in Clarke A (ed.) *The Genetic Testing of Children* (Bios Scientific Publishers 1998) 97-102).

5.2 *How much information do you think is required for the informed consent of an adult in the following cases:*

1. *Diagnostic testing*
2. *Carrier testing*
3. *Pre-symptomatic genetic testing*
4. *Testing carried out in pregnancy?*

In each of these situations the guiding principle should be that those to whom testing is offered have access to enough information in a form they can understand and use for them to feel able to give their informed consent, confident that they have explored the issues to their own satisfaction. For some, this will need careful explanation of the scientific underpinning for the proposed test, with detailed discussion of its possible consequences, limitations and broader implications, including a discussion of possible further tests in the future in the light of scientific advances. Others will be happy to take the information much more on trust, confident in the recommendation of their medical advisor that it is appropriate, relevant and necessary.

What needs to be put in place are mechanisms for auditing and confirming when a given individual has reached a reasonable and informed consent, and not just assumed to have done so by the doctor or other medical attendants. Protocols, available materials to back up oral explanations, access to web-sites and other resources are all evidence of mechanisms in place to enable progress to be made to the making of an informed decision.

Nor should it be assumed that adults with, for example learning disabilities are incapable of making complex decisions. Work by groups such as "People First" and "Change" has demonstrated that, given appropriate access to information, people with learning disabilities are able to make sophisticated choices.

5.3 *Is it acceptable for family linkage studies to be carried out on:*

1. *Children with consent from a person with parental responsibility and if so under what conditions?*
2. *Adults not capable of giving consent for the benefit of other family members and if so, under what conditions?*

The brief answer to both questions is 'yes'.

The nature of linkage studies requires genetic material to be taken from a range of people to aid research or for the benefit of particular individuals. Clearly this poses specific problems and requires particular safeguards, one of which should be that further genetic tests would not be conducted if the individual from whom the material was taken was unable to give consent. In this, as in other areas the guiding principle is the weighing of the potential benefits and harms to all involved, including children or mentally incapacitated adults and making decisions about whether or not to proceed in a particular situation in partnership with the affected individuals and by using a clear rationale.

- 5.4 *If testing techniques give information on many genes of disease, then should all the results be communicated to the patient or only those to which the patient had explicitly consented?*

The assumption underpinning this question is that the development of technologies such as gene chips will inevitably lead to the generation of broad spectrum DNA information about individuals. This might not be the case. It is entirely possible once research has indicated which genes are associated with particular conditions, that chips will be manufactured that will screen for those genes, or relevant mutations in those genes only. Indeed if this were felt to be a more desirable outcome regulations could prevent the use of broad spectrum screening chips, thereby avoiding the "problem".

Even if this was not to be the case and broad-spectrum screening were to be introduced, the principle of consent is not invalidated. Prior to undertaking screening the possible outcomes in terms of unsuspected genetic risks that may be revealed should be discussed and agreement obtained as to the course of action to be adopted in the event of such risks coming to light. This could be concluded in broad terms, such that only situations where interventions were possible were revealed for example, or all potentially significant data disclosed whether or not any alteration of the subject's natural history were possible. It must not be overlooked that, in most situations broad spectrum screening will only reveal one or two recessive mutations for rare disorders and possibly a number of common conditions where there may be a small increase in predisposition vis a vis the rest of the population. It is unlikely that large numbers of potentially important

mutations will be revealed in the absence of a family history of particular conditions.

- 5.5 *Would the carrying out of DNA analysis on a sample, for example a tumour biopsy, require the specific consent of the patient or would general consent for medical tests to be conducted be sufficient.*

The important issue in most cases is the diagnostic or therapeutic information that would be revealed, not the route by which it was acquired. However, DNA analysis could have further implications for the individual or for family members. Good practice would dictate that these should be explored beforehand with the patient as part of the consent process. As the consultation indicates, other issues are raised if the purpose of diagnosis is for research.

- 5.6 *How can the principle of informed consent be applied for paternity testing or other testing conducted by organisations based outside the UK?*

Realistically, nothing can be done to prevent determined individuals with access to resources of their own using services available in other jurisdictions outside the UK and countries with whom it shares legislation. The fact that some people may chose to do this should be kept in proportion. The total numbers will probably be small and the action necessary to prevent it likely to be disproportionately draconian. As an example, in the UK in-vitro fertilization in post-menopausal women is not licensed by the HFEA. It is permitted in Italy, but only a (very) small number of women have availed themselves of the opportunity.

## **6 Communication within families and the right to privacy.**

The issues raised in this section as a whole, as they pertain to the clinical setting rather than the research setting, were addressed by a working party convened by the Genetic Interest Group, which included clinical, legal, ethical and patient representatives. The full report of the group, *Confidentiality Guidelines*, is attached. In summary form, the group made the following recommendations:

‘Central to this document is the notion that it is often necessary and appropriate to use individual medical-genetic information for the benefit of relatives. Medical genetics in the UK is based on this notion and on professionals using such family information responsibly. This professional practice, although well established, is based on ‘common sense’ and a collective understanding and consensus view of ‘best practice’.

This report aims to support, supplement and formalise existing best practice. We have tried to provide a framework of written guidelines which define both limits to individual confidentiality in the medical genetics context and how issues and conflicts relating to confidential information can best be approached in daily practice.

In attempting to formulate written guidelines, the following recommendations are made.

1. In general and wherever possible, individual genetic information should be used for the benefit of family members.
2. In general, individual genetic information should only be used with the explicit consent of the index case.
3. A consent form should be adopted as a means of formalising and recording consent to share family information.
4. If consent is given, it is worthwhile using any information which increases the accuracy of diagnosis or risk estimation.
5. Consent forms should facilitate sharing necessary genetic information between professionals in different centres when the family is geographically dispersed.
6. Generally, when individuals are unwilling to share genetic information with family members this wish should be respected.
7. Professionals should have the discretion to breach confidentiality according to the following principles:

*The right to confidentiality of the index case should be protected when the potential harm caused by breaching confidentiality outweighs the potential benefits to the relative of being informed.*

*Conversely, disclosure without the index case's permission could perhaps be justified if the potential harm to the relative of not being informed, and the benefits of being informed, outweigh the potential harm to the index case of confidentiality being broken.*

8. The decision to break confidentiality will ultimately have to be made by an individual, usually the consultant in charge of the patient's care. But this will often follow discussion between a number of healthcare professionals.

9. Before breaking confidentiality, it may be appropriate to try to contact the index case to ask them to reconsider their objections.
10. Such decisions and the grounds by which they are reached should be documented.
11. Professionals should be permitted the discretion to disclose genetic information to an individual who is unaware of their risk status (although this should not be a duty imposed).
12. A decision to do so should be based on the following principle:
 

*The likely benefit of being told outweighs both the potential harm of remaining ignorant and the potential harm and anxiety of being told.*

The burden of proof for this lies with the professionals who decide whether or not to make such a disclosure.
13. The decision to disclose will ultimately have to be made by an individual, usually the consultant in charge of the patient's care. However, others should be consulted including, if possible, someone who has had a good deal of contact with the individual concerned.
14. Further research is needed on the psychosocial impact on individuals who have been given the unsolicited information about their genetic risk.
15. A high level of education is needed at all levels: secondary school; medical and GP training; and the media.'

These and related issues are currently being further considered by a working party of the British Society for Human Genetics.

In the research setting more care is needed because of the possibility that results will be less valid and/or reliable. Additionally, if the research subject has indicated that they do not want information fed back to them, it must be very doubtful whether it would ever be right to inform a relative.

When screening programmes are introduced the National Screening Committee on cost/benefit as well as clinical efficacy grounds carefully evaluates them. This means that, for the foreseeable future any such screening programmes are likely to be restricted to conditions where therapeutic or life-style intervention produces tangible clinical benefits. The consultation document states (6.12), and GIG agrees, that in such

circumstances people are likely to welcome such information as it gives them the chance to act and reduce their risk. It seems unlikely that there will be any move to introduce screening for minor conditions. But even if there were, minor conditions **by definition** do not create significant cause for concern in most people and are unlikely to be seen as a major infringement of privacy, genetic or otherwise.

Overall, such evidence as exists—for example arising from the introduction of the offer of DNA testing for families with a known history of bowel cancer—indicates that the fact that the new information is derived by DNA technology is generally not seen as particularly relevant when compared with the benefits that accrue to those screened. In this example, a negative result removes the need for regular, invasive, examinations.

- 6.3 *Does the current framework of law against the unauthorised disclosure of medical information provide adequate protection for genetic information?*

There is no evidence of any widespread unauthorised disclosure of genetic information by professionals. In any situation where a person feels that their privacy has been unwarrantably breached there are mechanisms for them to seek redress—through internal NHS complaints procedures, via Community Health Councils (or their replacement) or ultimately in the courts. It would be instructive to commission research into the nature of complaints that have actually been lodged by people who feel their genetic privacy has been compromised, on what basis they have reached this opinion and whether matters have been satisfactory resolved.

- 6.4 *What further measures, if any, should be considered to give particular protection to the confidentiality of genetic information in this context?*

Given that there does not appear to be substantial evidence of bad practice with regard to unauthorised disclosure of genetic information to family members, we do not see the need to extend the scope of existing mechanisms to safeguard privacy. However, as genetic data comes into widespread use outside the context of clinical genetics centres there will be a need to ensure that other professionals are educated to enable them to appreciate the implications of this new information and handle it in ways that comply with accepted good practice.

- 6.5 *In the family context, should there be a “right not to know”? If so, should this right be absolute or could it be breached in certain circumstances? If it could what should the circumstances be?*

This issue is addressed above and in detail in *Confidentiality Guidelines*. GIG does not believe that there can be a “right not to

know”, or more to the point that such a notion can resolve the real dilemmas thrown up in clinical practice.

In the consultation document insufficient distinction is drawn between knowledge of risk status and genetic knowledge derived from a personal DNA analysis. Whilst GIG believes that people most definitely should have a “right not to know” their exact genetic status if that is their wish, we do not believe this solves the real problem that arises in the clinical context, which is *unsolicited disclosure of risk status to someone ignorant of this*. On the whole, experience teaches us that more people wish to know their risk status than their exact genetic status, as this gives them the chance to make a choice. For this reason professionals encourage patients to inform family member of the risks they themselves may face. Similarly professionals must consider disclosure themselves if this is the only way to communicate information.

## **7 Personal Genetic Information in Research**

### **7.1 *Is this a fair representation of the issues in research? Is there something else we should have added?***

Medical research is already a highly regulated area of human endeavour. In general the system works reasonably well, with failings being the result of human error, misjudgement on the part of regulators, or researchers exceeding their brief, rather than any fundamental flaw in the system itself. Against this background, the case for any special regulations controlling genetic research needs to be made—remembering that the arguments are unlikely to be clear-cut and will involve balancing risks and benefits. It is always possible to increase regulatory control over research, but in so doing we must not forget that controls tight enough to eliminate any possibility of abuse or misuse may also preclude activities that would result in substantial gains, leaving people suffering from the consequences of conditions that might otherwise have become treatable.

Secondly, the uncertain outcome of research means that it is not possible to know in advance what all the consequences of a particular investigation may be. The examples given in the consultation document itself demonstrate the power of human tissue archives as a tool for generating important new knowledge. Genetic research is no exception to this and many families have donated samples for inclusion in banks and registers to permit research to be undertaken without feeling the need to know the precise direction of the research planned. Much valuable knowledge has resulted which was unanticipated by the investigator and for which specific consent in advance would have been difficult to obtain.

GIG is not convinced that all areas of genetic research give rise to special or additional ethical issues. The grounds for making this claim appear to be limited to the possibility of doing further research in areas not originally envisaged, but as the consultation document itself points out in para 7.8 this is not limited to genetic research but applies to virtually all stored samples. To separate out genetics in this way is not warranted. It is also to fail to recognise that, in most cases where complex multifactorial disease are under consideration, the value of genetic data arises from epidemiological studies with individual contributions being of little value in isolation. To treat all genetic data as if it had the same impact as that of rare genes for severe conditions like muscular dystrophy or cystic fibrosis is to contribute to the iconization of DNA and to give validity to a perspective that is in danger of becoming accepted and unchallenged simply through multiple repetitions. As the Nuffield Council on Bioethics report into genetics and mental health points out, once rare highly penetrant genes (such as the one for Huntington's or familial Alzheimer's) are put on one side, the contribution from any given gene to a person's chances of developing a future mental health problem is at most in the order of about 2% compared to the population risk and this is of much less importance than known environmental risk factors.

There is a significant difference between research using samples specially collected to permit the project to be undertaken and research projects which rely on archival samples. Clearly in both types of project there must be adequate safeguards to protect the subject, but in the case of new collections being started from scratch it is much easier to ensure that sample donors are in a position to engage in what is proposed and to give their informed consent. Participation in research under such circumstances is a voluntary activity on the part of the sample donor and if he or she has concerns about the downstream uses of this sample they are under no compulsion to participate. The best way of maintaining donor confidence is through the greatest possible transparency, with opportunities for engagement by participants throughout the programme, rather than excessively tight regulations that would constrain genetic research too severely. For many people genetic information may not seem particularly sensitive compared with other aspects of their medical history—such as their HIV status or the fact that they have a history of mental health problems for example.

Research using archival material needs to ensure that the interests of the sample provider are safeguarded. Where the researcher is using anonymised samples this does not seem to pose particular problems. Where a link to personally identifiable records is required the key to make the link possible should be held by an independent third party who sits between the researchers and the clinician with access to patient records and who is charged with the responsibility of ensuring that the proposed breach of the coding system is warranted.

Finally, the limitations of the “gift” relationship are acknowledged, but we feel that too much should not be made of them. The key to successfully exploiting genetic research’s potential seems to lie in transparency of intent and communication of progress. If this is achieved then many problems could be averted. It must not be forgotten that medical research is not an end itself, but is a mechanism for developing treatments for disease and disorders. The “gift” relationship in research is also one way of addressing the issues raised by commercialisation and creating equity between those who were asked to donate samples and those who might have been but weren’t. If samples are seen as a gift, but subsequent commercialisation creates profits then the interests of the donors may be served by earmarking a proportion of those profits to be returned for further research into as yet unexplored areas of the specific condition, or to fund better support for those whom the new treatment does not benefit. This would respect the common interests of all those with the condition in seeing progress towards treatment or cure.

7.2 *What types of information need to be given to someone donating tissue for use in a genetic research project?*

It is not really possible to specify with any great precision what information a person will need in order to give their informed consent to provide samples for research purposes—whether the proposed research is genetic or of some other type. While some will be content with broad categories others will want to know specific details. Both approaches are valid. What is important is that, as far as possible information about the proposed research is transparent, in the public domain, open to scrutiny and audit and that the mechanisms for ensuring these are clear, worked out and in place in advance. It is also important that potential participants are not pressured into agreement and that they know that they can withdraw (although if their samples have been fully anonymised their results will not be deletable).

7.3 *For future research on the sample, is specific consent to particular types of genetic research (e.g. research on heart disease or cancer) adequate?*

While totally open-ended consent is undesirable (and probably unobtainable from many people), consent that is too specific and limited is also problematic, in that further investigations would become both expensive and bureaucratically complex to undertake—with the probable consequence that they would not be initiated. Given that future research directions are unknowable, the only practical option would seem to be to obtain consent to fairly broad categories of investigation. If the project is transparent in the way outlined in 7.2 above, then this should be sufficient to protect individuals from abuse and retain public confidence.

7.4 *Alternatively, would an opt-out system be acceptable and if so on what basis?*

Opt out systems suffer from the limited ability of the participants to imagine and describe future possibilities. This is clearly an imperfect skill and failure to exclude particular categories of investigation may allow unforeseen areas to be researched in ways not thought to be possible at the time of the initial consent. Whilst this may be attractive to the researcher, it may not be in the best interests of either the research community or the public at large. Sufficient freedom to investigate can be obtained using an opt in system with broad boundaries.

*Is it acceptable to use material left-over from surgical operations for research in general?*

If consent has been obtained from the patient prior to surgery then materials abandoned as a result of the surgical procedure can be used in research provided that the proposal meets other ethical and regulatory criteria.

7.6 *Is it acceptable to use material left-over from surgical operations in genetic research? Should there be a different approach for anonymous and for identifiable material?*

The constraints on non-genetic research and the safeguards necessary to protect patient interests apply equally in respect of genetic research. If the individual donor is identifiable proper protection of his or her interests needs to be in place in order to ensure that the research is ethical - and if it is not then it should not be permitted! Such safeguards should be established with regard to the power and the sensitivity of the information likely to be revealed by the research and not only with reference to the process or the biological source material by or from which they become known.

7.7 *What types of information do patients need concerning the potential use in medical research of tissue removed during an operation?*

See 7.2 above.

7.8 *Should unexpected findings from genetic research be fed back to the donors of the sample:*

1. *If the sample was given specifically for research.*
2. *If the sample was left-over tissue from an operation.*
3. *Only if the person had given consent to such feedback; and*

4. *If the findings could enable the person to take action to prevent damage to their health, even if the person had not asked to receive this information?*

It is not possible to give hard and fast rulings that will be universally applicable. Unexpected findings are, by definition un-anticipated and must be handled in the light of circumstances prevailing at the time. Good practice would indicate that the possibility of unexpected findings be indicated to sample donors and some measure of their wishes taken at the time of obtaining consent.

Prior to the test for Huntington's disease becoming available many at risk said they would want to take the test. When the test was possible only a small proportion actually came forward to take it. On the other hand, those with familial bowel cancer showed no such reluctance, probably because the information could be used to alter their circumstances. Both examples may, however, be atypical. In most large sample genetic research projects it is unlikely that individually significant data will often come to light. Given that such data at the time of its discovery will be of uncertain predictive or clinical value it may not be desirable in any case to feed this back to the individual who provided the sample until further work has been carried out to validate it.

Overall, whether or not individually applicable results should be fed back will depend on their potential significance and the opportunity they provide for the donor to alter his or her circumstances. What is important is that there is a clear, shared understanding at the time of recruitment as to what is likely to happen and the possibility of altering this in the light of future developments (for example the development for new treatments or the recognition of specific gene-environment interactions). If it is thought that the information may be fed back, a connection will need to be maintained between the individual and the research team. Further consideration should be given to this, especially in cases where a significant time has elapsed between the initial consent and the generation of new information.

## **8 Making commercial use of personal genetic information: Issues of ownership and property.**

- 8.1 *Is this a fair representation of the commercial issues? Is there anything else we should have added?*

Ultimately the purpose of undertaking medical research is to improve our understanding of the biological processes that underpin health and disease, with the objective of promoting the former and preventing, ameliorating or curing the latter. The research is not an end in itself, but is a means to an end. In some areas of medicine the link between

interesting research findings and improved outcomes for patients and potential patients and their families has been created by involving the private (commercial) sector. This is particularly the case in respect of new drugs and devices. In all Western societies this is the route that has been chosen to ensure that certain areas of human endeavour ultimately produce health gains for the population (or for specific subsets of it). There is little prospect of radical change in this arrangement, so for the foreseeable future commercial interests will continue to play a significant role in realising the benefits of medical research.

In considering the issues that arise from the obtaining of personal genetic data it is essential that this context is clear if the issues raised are to be debated and decided rationally. It is also important to recognise that, in the absence of established alternative mechanisms for translating scientific advance into better therapies that are safe and effective for those who need them, there is a cost associated with constraining commercialisation. There must be recognition of the need to balance the interests of all stakeholders in the health care research and development process in the pursuit of individually and societally desirable goals.

It is rare that samples derived from one individual will be uniquely responsible for the eventual development of a commercially viable product. Even if this were to be the case, there is likely to be an element of chance in the fact that the sample was derived from a given individual rather than from any other member of the patient group affected by the condition each of whom, under different circumstances, might have been asked to provide a specimen that eventually results in the new product. In the case of common, complex disorders, the contribution to the new knowledge and ultimately to the product that emerges from any given individual sample may be extremely small. To acknowledge the interest of the person who provided the sample over that of the group as a whole, whether by means of affording a degree of control over subsequent development or by financial reward, may be disproportionate. It is also almost certainly inequitable.

One way of acknowledging the interest of donors in the profits of commercialisation may be through a contracted commitment to ring fence a proportion of the profits for agreed purposes beneficial to the group—through further basic research, or enhanced services perhaps. Of course mechanisms for achieving this might be difficult to implement, particularly in the case of indigenous peoples where the societal infrastructure of the western world capable of implementing such an arrangement may not be in place.

It could be argued that, if the absence of a commercial partner meant that promising opportunities for the development of new therapies remained un-developed, then the NHS (or the research charities

funding basic research) might feel itself under an obligation actively to seek out such partners in order to ensure maximum return in the initial investment for the benefit of patients. The NHS's position as a monopoly provider and purchaser gives it a powerful lever to ensure that subsequent pricing arrangements lead to affordability and maximum patient benefit.

- 8.2 *In what circumstances, if any should the genetic information of NHS patients be made available to commercial companies engaged in medical research? Should bodily samples taken by the NHS for diagnosis or as a result of surgery be used for commercial research?*

Genetic information about individual patients should only be supplied to commercial organisations if it is either anonymous or if the key to enable findings to be linked back to the original donor is held by an independent third party (possibly analogous to the Data Protection Registrar) to whom a case had to be made by either the clinician/health authority or the commercial partner in order to link back. This should only normally be allowed if there were substantial scientific or clinical benefits to be had that outweighed the disadvantages of breaking the code and which did not disadvantage the donor significantly.

Where tissue samples rather than simply information derived from them are important to a research project, it should be possible for commercial companies to access them, provided the proper safeguards are in place. Account may need to be taken of the finite nature of some sample collections, though this point will also need to be considered by academic researchers. In practice of course the line between academic and commercial research is increasingly blurred today, with staff spending time in both sectors and commercial companies funding projects carried out in an academic setting. Important questions to address will include ongoing management of samples with multiple users, property rights, and possible commercial demands for exclusive access, which should in general be resisted.

- 8.3 *Should specific consent to the use of genetic information for the purposes of commercially-driven medical research be necessary before information is used for such purposes?*

Providing the safeguards referred to above are in place and information cannot be linked back to the donor by a commercial organisation (i.e it is anonymous or coded with the key held elsewhere) then genetic information is no different from other forms of personal medical information. If consent procedures generally make explicit the possibility of commercial development should the opportunity arise then seeking specific additional consent for genetic information would single it out in a way that is not warranted. This would have the probable consequence of reinforcing people's fears

that the information was somehow special and making it more difficult and therefore less likely, that new diagnosed and therapeutic products would be developed. Many people do feel that genetic information is “different” in some way—largely as a result of an exaggerated perception of its potential and power. Rather than acquiescing to this and thereby legitimising it there should be a sustained effort to demythologize DNA. Failure to do this will set a precedent for handling future bio-medical developments (such as proteomics) that will make R & D less attractive and more complex, with inevitable adverse consequences for those affected by conditions currently incurable but potentially treatable in future. This is in no-one’s interest other than those who, for whatever reason, wish to frustrate the realization of the realistic potential of genetics to improve health and reduce disease.

- 8.4 *Should the person who is the source of a tissue sample which is detached from his or her body in the course of medical treatment have any rights over what is done with that sample or with the DNA which it contains? If so, what should these rights be?*

If a sample is permanently and inevitably anonymised then it is difficult to see how the original source could retain any rights over its subsequent use. However, before the sample is removed consent for its use in research (making clear that commercialisation may result from this) should be obtained in order to reduce the possibility of future conflict. Individuals have the right to refuse to consent to any future uses of tissues or organs removed that are not relevant to the clinical management of their case.

If samples are not to be anonymised, then the source person needs to be in possession of the information they feel they need to give their consent to the uses to which that sample will be put (see section 7 above). As the consultation document makes clear, the law is uncertain in this area and clarification as to whether any residual property rights might remain, whether tissues or organs are abandoned or whether the treating clinicians or the health service can regard them as a gift would probably be beneficial.

- 8.5 *The HGC will be monitoring the area of human genetic databases in the future. Are there any particular issues you would like to draw to the Commission’s attention?*

In monitoring the human genetics database the HGC should liaise with other statutory and non-statutory bodies (e.g. the MRC, the HFEA, the Wellcome Trust and commercial and voluntary groups) to ensure that monitoring systems are relevant, appropriate, coherent and do not constitute an unnecessary burden. They should also back such monitoring with public communication and dialogue, so that there is widespread understanding of the proportionality of the monitoring

system put in place to the possibility for abuse and the potential consequences of such abuse.

## **9 Protecting the confidentiality of personal genetic information: insurance and employment.**

### *9.1 Is this a fair representation of the insurance issues? Is there anything else we should have added?*

In this area as in others a clear understanding of what is meant by the term “genetic information” is important. Most of the public and policy discussion of the issue of genetics and insurance over the past five or six years in the UK has focused on the possible use by insurers of predictive DNA test results on adults who are currently free of the condition to which the test result is thought to be relevant. As the consultation document points out, another form of predictive genetic data, family history, has been used by insurers for many years, often resulting in increased premiums or a denial of cover. A further, and most probably larger group who also lose out in the insurance context is made up of people who have disabilities or are already ill. They may face a shortened life expectancy or a greater need for care than the average person. This may be for genetic reasons, as in for example the case of a person with cystic fibrosis, or it may not.

A realistic assessment of the predictive power of genetics and of Government and individual behaviour in relation to predictive testing, suggests that those with a family history and those with existing disabilities or illnesses are likely to constitute the largest group who experience problems in the insurance context for the foreseeable future. We should not lose sight of this when examining the use of predictive DNA test results.

The significance of predictive information—whether on people who are currently healthy or not—will also depend significantly on the form of insurance sought and the wider social context, including non insurance-based means of support. The situation in the UK differs markedly from the United States in the latter regard. In the US, the centrality of insurance to the delivery of healthcare, a clear social good, has dramatic and clear implications for the use of genetic data by insurers. Couple this with the fact that many employers cover their employees’ health insurance in group schemes, and the danger of exclusion from cover and even work is a real one. In the UK, the existence of the National Health Service removes this problem for most people. If the UK Government were to follow the policy of the Scottish Executive, the same would also be true of long-term care.

Currently, insurers seek information that is already known to the individual. If a **requirement** for genetic testing for insurance were to be introduced it would certainly alter the situation dramatically (para 9.9).

Should insurers seek to change policy in this way the public and professional backlash would be considerable. In GIG's view, the taking of samples without clinical need would be unethical and if done without consent would probably constitute an assault. In sum, it is a policy that GIG and probably all other genetic support groups would resist strongly were it even to be mooted. In reality however there is little evidence that the insurance industry is thinking along these lines, and the Association of British Insurers has repeatedly stated that no such requirement will be introduced. We would caution against repeated hypothesising that such a policy may be introduced in the absence of any serious evidence. There are real problems to address as it is, and these are not best addressed by alarming the public about what might be the consequences of such a *volte face* by the insurance industry when there is no evidence it is likely.

9.2 *Should insurance companies be required to consider personal genetic information differently from other medical information or family history. If so, why?*

The consultation document advances three possible arguments for considering predictive genetic data apart from other forms of medical information: that seeking genetic information is particularly intrusive, revealing the very essence of a person; that people might be deterred from taking medically beneficial genetic tests for fear of how insurers might use the information; and that tests might be misinterpreted, given a predictive value that they do not merit.

GIG takes positive exception to the first argument. Genes are not the "essence" of an individual and to support the notion that they are is to endorse a naturalistic view of humankind that diminishes us all. They are not even the [physical] essence of an individual. Such an idea is excessively deterministic. Even in relation to health, many other factors are crucially important.

Some people may indeed find it intrusive when insurers ask for genetic test results. But ethicists and regulators need to consider genes and genetics in a realistic medical and social context. Is asking for genetic information uniquely intrusive? Some people may find it more intrusive if they are asked, say, for the prognosis following surgery to remove a tumour. Alternatively, other individuals may have come to terms with the genetic and other factors that affect their health and longevity and may not find any questions about them especially intrusive.

The assertion that people might be unwilling to take genetic tests if they thought it might adversely affect their insurability is largely that, an assertion. There is certainly evidence to the contrary. Demand for genetic testing is rising across the country and regional genetics centres are under pressure to meet the increasing workload. Much of the debate about the consequences of patenting the BRCA1 gene has

focussed on the assumed inability of the NHS to afford to purchase the test for all those demanding it.

It could be that people are just unaware of the possibility that test results may affect them in an insurance context. There is anecdotal evidence that this is the case. But there is also evidence that for those who are aware of the issue the potential impact on insurability does not figure largely in their minds when contemplating predictive testing for a serious genetic disorder—other issues, about health and their future lives are more important.

This is not to say there might not be a problem. One or two reports do indicate a concern. Specific research looking at actual behaviour should be commissioned.

The issue of misinterpretation, specifically the danger that data may be given a predictive power that it does not merit, does concern GIG. The current regulation of predictive tests results by the Genetics and Insurance Committee (GAIC) addresses this in part. Specifically, the use of hurdles—50% raised mortality and 25% raised morbidity—is a useful barrier to the misuse of mild predisposition data. GAIC have only approved tests in relation to one condition so far (Huntington's disease, as of 1 February 2001), and do not expect to receive applications for the approval of products in relation to more than a handful of predictive DNA test results in the short to medium term.

However, the current hurdles do not address the *quality*, that is the actuarial accuracy, of the data that is actually used by companies. Couple that with the fact that the 50% or 25% hurdles only have to be cleared for one age group for the condition to pass the relevant regulatory test, and it is quite conceivable that poor data could be used in assessing a number of conditions for a number of insurance products. It should be noted that Huntington's disease crosses the hurdles with considerable ease at all age groups.

The industry would argue that a hurdle model is the norm for the use of all data, that it is typical of a free market system working on the basis of the "freedom to underwrite". However, to maintain the focus on predictive DNA test data on healthy individuals, if some of this data were to be used in the future, the clear possibility is that in the first instance associations with disease would be generated rather than any other, possibly health giving effects of the same alleles. Similarly, if studying individuals with conditions generates the data, the risk will be that the penetrance of the allelic variants will be exaggerated (as happened initially with BRCA1).

This is an issue for the future, and there are other factors that count against such a scenario, including the implausibility of widespread testing in the clinical context before measures can be taken to reduce

what will in any case be relatively small risks which may not cross the existing hurdles used by GAIC.

Presently, GIG's concern is that the *rarity* of many genetic disorders can encourage insurers to adopt a cautious attitude, one that protects their interests, when faced with genetic information. This is because the numbers of people with such conditions may be too small for companies to have an incentive to market attractively priced products. Unless up to date medical information is brought to bear on actuarial calculations, individuals will be loaded on the basis of the risks run by people in the past, or those in whom the phenotypic effects may seem to be clear and harmful.

There is anecdotal evidence that this is what often happens in practice. It would be useful to research this point further. In addition to studies using the experience of GIG's member groups and other genetic charities, it would be interesting to examine the models used by individual companies, perhaps using applications by hypothetical individuals.

This is an issue that arises from the rarity of the condition rather than the nature of the information used, whether it is medical data on someone already ill or disabled with a genetic condition, family history data, or predictive DNA test results on someone unaffected by an associated condition. In this sense, GIG sees little benefit in making a special case of one form of "genetic" information compared to another.

9.3 *In the light of the above questions, what principles should govern the way insurance companies may or may not use pre-existing personal genetic information?*

Following on from the concerns raised above, GIG would like to see an additional hurdle used within the regulatory process to guard against unfair discrimination. Companies that use genetic data of any type would need to be able to show that the data they use is actuarially accurate in the light of the most recent science. This would include an understanding of therapeutic options as well as genetic, actuarial and epidemiological data. What is accurate data may of course be a moot point. However, a body such as the UK Forum for Genetics and Insurance could be called upon to develop the best consensus available, based on collaboration between academic actuaries, geneticists and the condition-specific patient groups. The default position should be that genetic data is not used until it has been examined in this way.

To focus on predictive DNA test results specifically, GIG takes strong exception to the possibility of people not being able to be assessed as a standard risk as a result of a test result that shows that they are free of the disease-causing mutation. Currently, the insurance industry is

operating according to a principle of equivalence between positive and negative test results. If they can't use one, they say, they will not use the other. The result would be that someone with a family history of an adult-onset dominant disorder for example who has been shown not to possess the mutated gene as a result of a DNA test would nevertheless be assessed as if they hadn't had the test. That would be absurd.

Families with rare conditions such as Huntington's disease and familial Alzheimer's are those for whom the debate about predictive data is currently relevant. Materially more would probably gain than lose from the use both ways of predictive DNA test results compared with not using the results at all. For many people in particular insurance contexts, the possession of a family history of such conditions is sufficient to make the insurance product unaffordable. In such cases the extra loading due to a DNA test result indicating a higher risk is therefore immaterial. But on the other hand those shown by a test to be at a much lower risk could be offered lower rates. Regulators and policy makers should take care to ensure that they do not make things worse by banning the use of data altogether, or by making changes that the insurance industry then reacts to by protecting its own interests at the expense of groups of genetic patients.

As a matter of social policy it has been suggested that test results indicating that a person does not possess the disease-causing gene variant should be used but not those indicating the presence of the disease-causing gene. Evidence suggests that as long as standard family history data and other medical information was still used insurers would face only a very limited amount of adverse selection, now and most probably in the future as well. Such a policy would benefit some individuals today. But that would only come at the expense of those in the family history 'pool' if the rates offered to those with a family history were adjusted upwards based on estimates of how many might also be in possession of DNA test results indicating a higher risk. If the policy of not using test results indicative of the presence of the disease-causing gene is adopted, measures should also be put in place to ensure that family history levels are not adjusted upwards. Once again, regulators need to think carefully about the knock on effects of their actions if people are to benefit.

- 9.4 *Should any such principles draw distinctions between:*
1. *different types of insurance (e.g. life/health)?*
  2. *different types of conditions (treatable/untreatable)?*
  3. *the value of the policy to be insured?*

Currently the principles upon which insurers are able to use pre-existing genetic data are applied across the board. Changes in practice—for example a decision not to seek genetic disclosure for

particular types or values of insurance cover—are as far as the industry is concerned a matter of policy not of principle.

In GIG's view, a system of solidarity should hold in health and other areas such as long term care where the needs of the individual are being met. Currently risk pooling in these areas is achieved through the NHS and in a more limited way through the state provision that exists for long-term care and through forms of disability payments to those unable to work. The insurance markets are quite small, though growing. If insurance were to become the primary means through which individuals secured their needs in these areas, GIG would press for a system of non-disclosure of all health data.

In relation to life insurance some form of disaggregation according to risk seems inevitable. It is a question for debate and public policy how far that should go

- 9.5 *The HGC will be separately considering other aspects of the use of genetic test results in insurance. Are there any particular issues you would like to draw to the Commission's attention?*

To continue the points raised in 9.2 above, and working on the assumption that some form of genetic data (whether arising from DNA test results, family history or other clinical symptomatology) will continue to be used, the question arises as to the extent to which a company can, in pursuit of its commercial strategy decide not to accept a particular type of business, even after following a rational, reasonable process. What would be the implication if a large number or all insurance companies were to go down this same route? Would there need to be an element of compulsion in order to make this social good available and if so, what form it might take?

- 9.5 *Is this a fair representation of the employment issues? Is there anything else we should have added?*

Whilst the position laid out in the consultation document in respect of genetic testing in relation to employment is a fair summary of the issues, it must be stressed that this is a very hypothetical discussion. As the document itself states, there are no employers in the UK currently using genetic tests (with the possible exception of the MoD in the circumstances stated) and to the best of our knowledge there are no employers planning to introduce pre-symptomatic screening of employees or applicants.

Of more immediate concern is the ability of employers or their company medical advisors to appreciate the significance of genetic disorders for which people are presently symptomatic. There is anecdotal evidence of discrimination. This is an issue covered by the

Disability Discrimination Act and over time presumably case law will develop that will offer guidance on this.

- 9.6 *Do you have any comments on the proposed principles which should govern the way employers use genetic information?*

GIG endorses the HGAC's principles on genetic testing in employment.

- 9.7 *The HGC will be monitoring the area of genetic information and employment in the future. Are there any particular issues you would like to draw to the Commission's attention?*

In this, as in other areas care must be taken to avoid endorsing a perspective that a problem exists where in fact this is not the case. If the introduction of genetic testing in employment were to become an issue in the future, then the principles laid down by HGCs predecessor bodies (HGAC and ACGT) with regard to genetic testing would need to be promoted, coupled with an educational programme for employers and others to ensure that the likely pros and cons of any such programme were understood and properly evaluated before it was set in place.

## **10 Personal genetic information in forensic databases**

- 10.1 *Is this a fair representation of the forensic issues? Is there anything else we should have added?*

It is not within GIG's sphere of competence to comment on the issue of forensic databases and the circumstances under which the collection and retention of DNA based information should be permitted. However, there are a number of general points where the operation of DNA databases in a forensic context will impinge on areas that are of concern to us, which the HGC should consider. These are as follows:

The precision with which forensic databases can pinpoint an individual suspect and be used to confirm guilt or innocence is not automatically transferable to other situations. The clinical inferences that can be drawn from genetic diagnosis in the clinical context are often much less precise. The publicity surrounding forensic DNA applications may lead people to expect the same degree of certainty—with consequences for their expectations about likely future benefits or possible adverse applications of genetic data and the regulatory framework that needs to be in place to control this.

DNA samples gathered in the course of a criminal investigation from people subsequently proven to be innocent should be

disposed of promptly and in accord with the regulations in place if public suspicions about the “big brother” role of DNA in society are to be allayed. Processes for ensuring that this is so must be transparent, rigorously applied and studiously monitored by an independent body (perhaps the Data Protection Register?) to ensure compliance.

Genetic information from medical records should not be released to the police unless there are serious grounds for doing so, the information cannot be obtained from any other source, the person to whom the records apply has given his or her fully informed consent and no adverse inference is drawn from a refusal to allow disclosure.