

“St Vincent’s Hospital. The mission of the Sisters of Charity: compassion, excellence, human dignity, justice and unity – here exemplified in the human element of medical technology; haemodialysis at the Community Dialysis Centre.”

Should We Always Tell the Truth?

“Being diagnosed with cancer is a uniquely personal disaster for many patients. First and foremost, it affects their own life; no one, including physicians or families, can take over their burden. Diagnostic information regarding one’s body and life belongs to the person to whom it refers, not to family or physicians. Therefore, a patient’s wish to know or not to know the truth is the most important factor in determining disclosure.” (Atsushi Asai 1995)

The issue of truth telling is an extremely contentious one, whether it be the diagnosis and prognosis of cancer or some other terminal disease. Opinions are divided across the world both within and between different cultural and ethnic groups, but somewhere there must be consideration for the wishes of the individual concerned. It must also be noted that, depending on the particular circumstances, both the concealment of knowledge, and its disclosure, can be potentially harmful to the patient. Therefore, it is not only whether or not the truth should be disclosed but the way in which it should be disclosed which is important.

Telling a patient about a terminal diagnosis or a poor prognosis is probably the most difficult task that has to be undertaken by medical staff. The con-

veying of ‘bad’ news has to be done in a manner which delivers accurate and inclusive information without so distressing the patient that they give up on life immediately. Fundamental issues regarding disclosure of information include: whether or not to tell the diagnosis; how much to reveal about the treatment and prognosis; and how the individual should be told.

If one accepts that truth telling is good and that to tell an untruth is wrong because it deceives the person, and that to withhold the truth is to deceive just as much as to tell a lie, then patients have a right to information which will affect their lives and deaths. However, not every patient wants to *avail* themselves of that right. It must also be noted that in medicine, health professionals cannot speak in terms of *abso-*

FEATURING

| | |
|--|----|
| <i>Should we Always Tell the Truth?</i> | 1 |
| <i>From the Director</i> | 4 |
| <i>Human Experimentation Under Scrutiny</i> | 5 |
| <i>The Human Genome and the New Genetics</i> | 7 |
| <i>Some Ethical Concerns of Prenatal Diagnosis</i> | 10 |

lute or *whole truth* because they often do not know *exactly* what is happening or will happen to their patient over the course of their illness. However, for the health professional to be honest or truthful this could mean relating the information as they know or understand it, or expressing an opinion based on their practical experience.

Why in the situation of a terminal illness do people want to know the truth? Presumably the information gained will mean that the patient may be able to evaluate the quality of their future life, and this may even mean choosing the environment of their death. It may mean that the patient will be able to make an assessment of the value of any medical intervention proposed and be able to weigh up the inherent risks of any treatment.

Has there been a Change in Attitude Towards Truth Telling?

In the past, physicians did not always tell their patients their diagnosis. A landmark survey in the USA in 1961 by Oken showed that 90% of surgeons would not routinely discuss a diagnosis of cancer with their patients. Almost 20 years later, a study by Novack et al. found that this situation had reversed, with 90% of surgeons saying that they would tell their patients. This reversal in attitudes and obligations could be due to many things, and may include: improvements in cancer treatment

“there is a respect for personal autonomy and individualism”

which may suggest an apparently more optimistic future; a surge of interest in the topics of death and dying; or empirical research which helps health care professionals to understand more about the process of confronting life-threatening illnesses and how to disclose information. The growth of the hospice movement over the last twenty years has also led to a growing openness about

death and dying. The emergence of human rights has meant that there is an expectation that everyone has the right to information, rights that are not forfeited when we are sick. There is a respect for personal autonomy and individualism. There has also been a weakening of the professional dominance model of health care whereby there is an unequal distribution of power, and a movement towards the partnership model between patient and doctor. The legal requirements for informed consent may also have influenced the change in physicians' attitudes towards disclosure of a terminal diagnosis to their patients. Appropriate informed consent engenders a respect for persons and for the individual's power to make their own decisions regarding their health care after they have been given all the relevant information through honest disclosure. Even though a terminal diagnosis and prognosis may mean no more medical interventions aimed at cure or even control, there are still decisions that have to be made regarding appropriate palliative care, as well as family and other social affairs which have to be sorted out in the context of the person's limited future. Without an honest understanding of the future the patient cannot make these decisions.

Many studies have found that large

“patients who are seriously ill seem to know how ill they are”

percentages of people want to know their diagnosis, as lack of information increases stress and anxiety, especially if the patient suspects the true diagnosis or an even worse one. Without the information the patient can feel that they have lost control. Another argument which supports the disclosure of all information to the patient is the fact that most patients who are seriously ill seem to know how ill they are anyway. By not talking to them about their future or lack of it, you are subjecting them to loneliness and a feeling of abandonment. However, some patients prefer and benefit from ambiguous

information, as this lack of certainty enables them to maintain hope or the opportunity to deny the diagnosis.

What is the Conflict about Truth Telling?

It seems after reading many surveys and studies that the underlying reason for why decisions not to disclose an imminently terminal diagnosis and prognosis are made, is the fear that the person will experience painful emotions, refuse much 'needed' care, die more swiftly or even commit suicide. A suicide can be very stigmatising for a family, as well as being an indication of hopelessness on the part of the person who has suicided. This fear *for* the patient may be felt by individual physicians and by families and, in particular, by families from different cultural backgrounds. While the underlying *intention* for not wanting the person to give up on life, to despair, to experience fear, or to die sooner rather than later, is inherently a good one, there is no guarantee that if the person was told of their terminal situation they would react in this way anyway. Families and physicians who do not want the truth about a terminal illness disclosed to the patient are acting paternalistically, even though they are trying to protect the patient by acting in what they determine to be the patient's best interests.

The conflict about whether or not a terminal diagnosis and prognosis

“to reconcile these differences with the best possible outcome for the patient”

should be disclosed to a patient seems to be at its most contentious among different ethnic groups. While this can present problems in any environment, it seems to be at its most poignant when the wishes of some families conflict with the dominant paradigms of autonomy and respect for the individual, which have gained prominence over the last twenty years in the English speaking world. How to reconcile these dif-

ferences with the best possible outcome for the patient is indeed difficult. It must be recognised that in some cultures it is the family who are the primary decision makers in many matters, including what is to be told to the patient. Therefore, their protective role in the patient's life must be acknowledged by health care professionals, as they can be of the greatest support to the sick person. A survey of cancer specialists in Greece in 1996 found that 11% disclose the diagnosis to all their patients, 78% disclose it to some of their patients (based on factors such as a patient's personality, their anticipated reaction, their age, their literacy status, relatives' wishes, the patient's family situation, the doctor's ethical principles, the patient's sex, the patient's cultural background and the prognosis of the disease), and 11% did not reveal the diagnosis to any of their patients. Incidentally, of those Greek doctors who disclose the diagnosis to their patients, 83% inform the relatives first. This study does not indicate that Greek patients are generally not told their diagnosis, only that particular patients' characteristics influence the decision to tell or not to tell (which is similar to the situation in many countries), and that families play a large role at this time, as they are probably more likely to know the likely reactions of the patient than is the doctor.

Another area of conflict is the con-

“it is hoped that no-one would support intentional lying”

cept of mandatory disclosure. While it is hoped that no-one would support intentional lying or withholding of information specifically requested by the patient, forcing information on a person without considering their preferences to know it may actually cause them serious harm if they do not want to know the truth.

It is not easy to tell some-one that they are dying. Doctors who have to tell their patients such devastating information have to confront their own fears of illness and death, and

one would suspect that this does not become easier just because one has done it many times. Every situation is individual and has to be treated as such. Families also have to confront death when a loved one has a terminal diagnosis. It may seem easier if there is no open discussion, if one can ignore what is happening and just get on with the mundane practicalities of life, rather than openly confronting fears of future loss and loneliness.

How do you Know Whether the Truth Should be Told?

Towards the end of life when curative medicine has no more to offer the primary objective should be to enhance the quality of life of the person for whatever time they have left. To do this, the doctor should know the patient's preferences, including whether or not they want to know everything about their diagnosis and prognosis. For the doctor and patient who have had a long and understanding relationship, it is not difficult for the doctor to know what are the patient's preferences. In the course of earlier consultations the doctor may even have had the opportunity specifically to ask the patient about what information they would like to be told. It is when the doctor does not really know their patient, who is already very sick, or when there is a language barrier, that the doctor may be placed in the difficult position of not knowing what information, how much, and how to disclose information to their patient.

How Should the Truth be Told?

Information should be disclosed with a sense of warmth, empathy and support. The setting in which information should be disclosed should be private and free from interruptions, and, if possible, there should be a support person present. Disclosure of a diagnosis and prognosis cannot be viewed as a single communication or interaction. It must be an ongoing dynamic, sup-

portive process linked to continual monitoring of the patient's information status and their capacity to assimilate the information in terms of their anxiety level, their physical status, and their readiness to receive it. Understanding of 'cancer' can be surrounded by misconceptions, myths and fear. Sometimes an alternative word needs to be used to assist the patient to comprehend their situation without panicking. Occasionally, the mere utterance of the word 'cancer' means that the patient hears nothing that was said after it was mentioned. The actual explanation must be free from medical jargon, emotionally laden phrases, and euphemisms in order that it may be understood by the patient. Information may need to be repeated several times in different ways before it is 'heard'. According to Margaret Fitch, truthful information disclosure "must embody support for the individual provided by tailoring the conversation to the meaning the individual has of the situation and his or her personal language."

In the disclosing of information, regardless of whether it is 'bad' or not,

“people make choices about what information to reveal”

there is also the issue of privacy and confidentiality, which is based on the principle that people are self determining agents, and therefore *they* should be the ones who give permission concerning disclosure of private information about them. People make choices about what information to reveal to others based on the intimacy of a relationship. In the health care context patients often reveal information to doctors and other professionals that they have not told their families. It could be seen as an abuse of trust if the doctor then turns around and tells the family without the prior consent of the patient. A breach of confidentiality occurs if information about someone is shared without their authorisation, or when the information shared is confidential.

When language creates a barrier for communication between a doctor

and their patient, an objective, outside interpreter should be used, if possible, to ascertain the patient's wishes. While family members who act as interpreters may have the best intentions in wanting to protect their loved ones, they may be prone to censor information and this may not be in the patient's best interests.

Conclusion

Sensitive, accurate truth telling can empower the patient to approach death without despair and hopefully with some control. However, there should also be respect for the patient whose wish it is not to know, or be told. We should be culturally sensitive to other ethnic groups who do not give the same importance to

autonomy and individualism. We must make sure though that if a patient makes a *specific request* for information that it is given to them.

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Deirdre Fetherstonhaugh

From the Director

It gives me great pleasure to announce to our readers that at its last meeting the Board welcomed and approved the positive response of the St John of God Health Care System to our invitation to become members of the Centre with respect to their four Victorian hospitals at Ballarat, Geelong, East Brighton and Warrnambool. We hope their association with the Centre will be long lasting and beneficial. I have already visited the St John of God Hospitals at Ballarat and Geelong, and I hope to make an initial visit to East Brighton and Warrnambool before Christmas.

I have contacted all the Healthcare Member Institutions of the Centre with a view to seeing how our staff could be of assistance by way of offering ethical advice on particular issues or by providing inservice on topics related to healthcare ethics according to need. Inservice has begun

in several of our member healthcare institutions on topics raised by staff themselves.

During the year the Centre's staff have organised two Conferences for secondary teachers from Catholic and Independent schools on the *Ethical Aspects of Treatment Decisions at the End of Life*. They were successful and we will continue to hold occasional Conferences on Health Ethics for teachers in the future.

On behalf of the Centre and its staff I wish all our readers a Happy Christmas. ✦

Norman Ford SDB

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Human Experimentation Under Scrutiny

This article provides a background of the way clinical trials and human experimentation have become essential to medical science, and how the ethical evaluation of such trials has had to change over the years.

Medical Research – The Beginnings

Medical practice has always been 'experimental'. Medical innovations and advancements have largely been the result of trial-and-error. Anecdotal experiences have led to treatments being tried on other patients with similar conditions and the results observed. If a treatment was found to be effective, it would soon become an accepted therapeutic regimen. The trial-and-error method of early medical practice is a distant cousin to the clinical research that plays such an important role in modern medicine.

Although the first mention of the need for patient consent in medical research came from William Beaumont in 1833, it was not until later in the century that the idea was medically and legally acknowledged. It was in nineteenth century Prussia that the courts first considered the ethics of human experimentation. The case before the courts was that of Dr. Neisser, an eminent physician. The case involved uninformed and unconsenting prostitutes, who did not have syphilis but were in hospital for other reasons, and who were injected with cell free serum from patients who did have syphilis. Neisser's aim was to test the effectiveness of the 'vaccination'. Some of the prostitutes contracted syphilis, which to Neisser represented a failure of the vaccine. He did not accept that his serum injections may have been responsible for the prostitutes contracting syphilis. Instead, he insisted the women had contracted syphilis through their employment as prostitutes. The Royal Disciplinary Court ruled that although Neisser was a well respected medical authority who had *considered* the trials harmless, he should have nonetheless sought the consent of the patients involved. This was

the first recognition of the importance of informed consent in all human experimentation.

First Statement on Medical Research

Following the Neisser case the Prussian parliament, in 1900, issued a statement, which although not legally binding, aimed at guiding physicians involved in research. The statement advised medical directors that human experimentation on minors and incompetents was not permitted, nor was experimentation permitted on subjects who had not given their "unambiguous consent", after receiving information about the research and its possible risks. Human experimentation and its permissibility remained in the hands of the medical profession. The public at the time generally accepted that doctors were of ethical character, and were content to leave the assessment of trial suitability, and the assignment of subjects to experiments, in physicians' hands.

Doctors were thought to value the principle of nonmaleficence, preventing harm to their patients. Patients' consent to participate in a trial or to undergo experimentation of some sort was sometimes sought, but on the whole it was still not considered to be very important. World War II and the so called medical experimentation to which Nazi doctors subjected concentration camp prisoners, highlighted to the public that not all of the medical profession were as ethical as they may have first thought.

The Nuremberg Code and Helsinki Declaration

One of the results of the atrocious experiments conducted by the Nazi doctors was the drafting of the Nuremberg Code in 1947. The Code

sets out guidelines for medical experimentation on human subjects. It consists of ten principles which should be observed when conducting experiments with humans. The preface to the Code maintains that most doctors' research should conform to "the ethics of the medical profession generally". In other words it was accepted that the medical profession could self-regulate human experimentation as long as the research did not conflict with any of the principles in the Code. The Code's principles include: the voluntary and informed consent of the subject; the experiment should be expected to yield fruitful results that could not be gained through any other means; the experiment should avoid unnecessary pain, the degree of risk should never exceed the importance of the problem to be solved; the investigators should be scientifically qualified; and throughout the experiment the subject should be free to withdraw.

"the physician should always protect life"

The Nuremberg Code was the only universal ethical guide to doctors participating in human experimentation until 1964 when the 18th World Medical Assembly in Helsinki drafted what has become known as the Helsinki Declaration. The Declaration has been amended several times since. The Declaration contains similar principles to the Nuremberg Code but also deals with two additional issues. The first issue is combining medical research and professional care. The Declaration highlights the importance of weighing the drawbacks of possibly beneficial new technologies against the best current techniques. It aims to ensure all subjects in a study, even those in the control group, receive the best proven methods of treatment and that doctors can combine

medical research and professional care as long as the objective of gaining knowledge is justified by the value of the information for patients. Secondly, the Declaration considers non-therapeutic biomedical research involving human subjects. In this case it states that the physician should always protect life, subjects should be volunteers, and that the research should be discontinued if it is considered at all harmful to the subjects. It appears that research conforming to the Helsinki Declaration's principles should be considered ethical. However, the Declaration is only a guide, and for a long time human experimentation continued regulated only by the medical profession itself.

Medical Research – Lessons to be Learnt

The most effective way to demonstrate how peer review, the medical profession regulating its own research, failed might be a case study. This brief account is of an actual case which occurred in Auckland, New Zealand. In June 1966 Professor Herbert Green, a cervical cancer specialist with an international reputation, gained permission from the National Women's Hospital to conduct an experiment using human subjects. Professor Green did not accept the commonly held belief that cervical cell abnormalities were an early stage of malignant conditions. Instead Green believed that malignant cervical cancer was actually a different disease to localised carcinoma. Driven by this account and the consequential belief that many women who returned abnormal test results received unnecessary hysterectomies or other radical procedures, Green set out to test his hypothesis.

The experiment involved withholding conventional treatment for localised cervical cancer from some patients so that Green could observe the natural history of the disease. Green wanted to watch the disease run its natural course without the interference of treatment. Green be-

lieved that careful examination would identify patients who had invasive cancer so that they could be excluded from the study. The experiment was conducted for several years without any formal evaluation. The occurrence of malignant cancers among those women who were included in the study were dismissed by Green as diagnostic errors – the women should not have been included in the study. Green refused to see he might be wrong. Later, when the first death in the study occurred he still claimed that it was a diagnostic error in failing to diagnose a case of malignant cancer, rather than admit that the cell abnormalities were an early stage of malignant cancer. Green's inability to see he was wrong resulted in many women unnecessarily becoming

“peer review of medical research involving human subjects is not effective”

gravely ill and in some cases dying. Many questions need to be asked about Green's horrible experiment. These include: how hospital approval was granted to the experiment in the beginning, why the results were not monitored or evaluated, and why the women involved were never informed. Green's experiment contravenes the Helsinki Declaration in several major ways. Not all subjects received the best treatment currently available. The subjects were neither informed nor gave their consent to participate in the experiment, and the doctor's professional care was compromised because the knowledge gained was not of any benefit to the subjects of the study. Professor Green was a well respected gynaecologist whose work, as a result, went largely unscrutinised. When his experiment was first questioned his position and reputation were enough to see the criticism put down to a “personality conflict”. This and other similar cases have shown that peer review of medical research involving human subjects is not effective in ensuring that even minimal ethical standards are met. If Profes-

sor Green's reputation was enough to have the medical fraternity turn a blind eye to the harm his research was causing, there is no end to the damage that eminent scientists could cause with such a lack of regulation.

The NHMRC Statement

Human experimentation is much more closely monitored today than it was in the past. Previous articles in the Bulletin have described the value of informed consent, which is as central to experimentation as it is to normal clinical practice. Respect for informed consent has moved the focus of research towards respect for the subject, their safety and any benefit they might gain from participating in research. The National Health and Medical Research Council (NHMRC) is a federal body which distributes many of Australia's medical research grants. As some of the grants awarded by the NHMRC involve human experimentation, the NHMRC originally developed a statement on the subject and then later issued guidelines for institutional ethics committees.

In order to receive an NHMRC grant any research involving human subjects must be in accordance with their statement on human experimentation and approved by an appropriate institutional ethics committee. The NHMRC principles contained in the statement are not very different from those found in the Helsinki Declaration. The principles focus on informing subjects, gaining their consent and reducing any possible risks, and discontinuing the experiment if the patient is in any danger, or asks to withdraw from the study. Although the statement only acts as a guide if a research project requires funding, it must have ethics approval, forcing the researchers to meet the appropriate ethical standards. This is certainly a good start. Unfortunately, if the research is independently funded, it will only have to conform to NHMRC guidelines if it is to be conducted in association with an institution that has an institu-

tional ethics committee (IEC). Notes supplementary to the NHMRC statement on human experimentation detail the importance of institutional ethics committees.

The Need for Institutional Ethics Committees

In an attempt to regulate experimentation involving humans, the NHMRC recommends that any institution involved in such research should be responsible for maintaining an institutional ethics commit-

“it is the IEC’s responsibility to ensure that ethical standards are maintained”

tee. It is the IEC’s responsibility, according to the NHMRC, to ensure that ethical standards are maintained in research. After the lessons of the past, concerning the risks of the medical profession evaluating the ethics of fellow practitioners’ research, the NHMRC recommends that the IEC consist of a variety of people. The composition of a “properly constituted” IEC should include at least one person from each of the following categories: a laywoman and a layman not associated with the institution, a minister of religion, a lawyer and a medical graduate with research expertise. Although an institution is free to ap-

point as many other members as it sees fit, a decision concerning research proposals should only be made after the committee members from the above categories have all been given the opportunity to express their view.

The IEC should ensure that all research conforms to the NHMRC statement on human experimentation and that the rights of subjects take precedence over any expected benefits the research might have to human knowledge. A record must be kept of all proposed research and the IEC is expected to provide this information to the NHMRC upon request. The role of the IEC to ensure that potential subjects receive full information about a trial, and that the information is in a form that they can easily understand, should not be underestimated. Potential subjects of human experimentation need to be told about both the potential risks and side effects, as well as any potential benefit that research may have for them.

IECs are currently the most effective way of ensuring that ethical standards are met in all research involving human subjects. In the next Bulletin I will look at randomised controlled trials, the dilemmas they pose for hospitals and the conflict of roles when the same person is doctor and

investigator.

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Tracey Phelan

The Human Genome Project and the New Genetics

The Human Genome Project has attracted considerable media attention over the last few years. In this first of three articles we look at what the HGP is, why it was implemented, and what it is hoped will be gained from it. The legal, ethical and moral implications of the HGP will be examined in two further articles in the next two issues of the Bulletin.

Introduction

The Human Genome Project (HGP) is an international, fifteen year, 3 billion dollar, biological research effort sponsored by the United States Federal Government. Formally begun in October 1990, its aim is to discover and make a set of maps of all the 60,000 to 100,000 human genes (“The Human Genome”) and make them accessible for further biological study. Largely

based in the United States, it is run under the auspices of the Department of Energy (DOE) and the National Institutes of Health (NIH).

In the mid 1980’s David Smith, the now retired Director of the DOE, saw the development of a DOE HGP as the natural extension of that agency’s long-term mission to develop better technologies for measuring health effects, particularly induced mutations. The DOE had

been supporting mutation studies in Japan, where no inheritable mutations could be detected in offspring of populations exposed to atomic blasts. The program grew out of need to characterise DNA differences between parents and children more efficiently. The DOE led the development of many mutation tests, and was interested in developing even more sensitive detection methods. The DOE believed that sequencing the entire human genome

would advance this study and was successful in securing some uncommitted funds to begin a pilot project at a DOE laboratory. This, however, caused a reaction in NIH which funds most of the basic biological and biomedical research done in US: the NIH argued that any major human genome research should be based with them. Talks with the NIH led to many more people being involved, and in October 1988 the DOE and the NIH signed a Memorandum of Understanding. The Human Genome Project was born.

Australian and International Involvement

At least 17 other countries have also established human genome research programs. Some of the larger programs are in Australia, Brazil, Canada, China, Denmark, France, Germany, Israel, Italy, Japan, Mexico, Netherlands, Russia, Sweden and UK. In addition, about 1000 individuals from 50 countries are members of the Human Genome Organisation (HUGO), which helps to coordinate the international collaboration of the genome project.

Australia's financial commitment to the project is relatively small, but our involvement in the research is still important: a number of research groups in Australia are conducting research in areas of human genetics, while at the Adelaide Children's Hospital, a team funded by the US NIH is mapping chromosome 16 as part of the HGP.

Scientific Background

Each human cell nucleus has 46 chromosomes arranged into 23 pairs, with approximately 60,000 to 100,000 genes on those 46 chromo-

“there are thought to be roughly 3 billion base pairs in the human genome”

somes. Each human chromosome contains two copies of a DNA molecule. The DNA molecule consist of

two strands that wrap around each other to resemble a twisted ladder whose sides are connected by rungs of chemicals called bases (the well-known “Double Helix” symbol). The two DNA strands are held together by bonds between the bases, called “base pairs” or bp. There are thought to be roughly 3 billion base pairs in the human genome; a fruit fly has 165 million bps, while E. Coli bacteria has 4.67 million. A human gene can consist of anything from less than a thousand to many thousands of bp.

What Is the HGP Doing?

The primary goal of the HGP is to make a series of descriptive diagram maps of each human chromosome at increasingly finer resolutions. This will provide researchers with a “library” or “encyclopedia” of maps of the entire human genome and of several other “model organisms” (other animal models). The ultimate goal of genome research is to find all the genes in the DNA sequence and develop tools for using this information in the study of human biology and medicine.

The first half of the project is devoted to producing high-resolution linkage maps, while the second half will concentrate on sequencing. “Mapping” results in knowing the locations of a gene on a chromosome. Mapping technologies have been greatly improved, with the old technique, known as “chromosome walking”, being replaced with a newer technique called “chromosome jumping”. The gene for cystic fibrosis was mapped in about four years with a “jumping” technique, instead of the estimated eighteen years that “walking” would have taken. “Sequencing” means breaking down the biochemical parts of DNA into its components called nucleotides. Automated methods of sequencing, that use laser beams to read the order of the base molecules, speed this process up to the point that years of work by hand can be reduced to weeks of work by laser

sequencing.

At the moment, much of the effort continues to be spent locating and mapping genes. It is assumed that by knowing the locations of genes, and of relevant sequences, gene function (and therefore malfunction) can be more easily inferred. The “model organisms” also being studied, will permit researchers to confirm experimentally the function of specific genes by tracing gene products on the chemical level.

“merely identifying genes will not imply knowledge of their function”

Due to the exponential growth in technology, the HGP is currently two years ahead of schedule and will now be completed by 2003. Genes will be identified, for example, in relation to blood groups, enzymes, hormones, growth and, most controversially, genetic disorder. However, merely *identifying* genes will not imply knowledge of either their function, or variation in their expression. The HGP is creating research tools for well into the 21st century, when the goal will be to understand the sequence and functions of genes. There are still many, many decades of concentrated effort needed simply to interpret HGP's fifteen years of data collection.

Why Do It?

However, an important question still needs to be posed: why go to all this effort to map the human genome? Surely there are more worthwhile projects that could benefit from the 3 billion dollars being spent on this enterprise? Supporters of the HGP claim that large numbers of the most serious human disorders are the result of genetic abnormality. Moreover, it is claimed, the percentage of patients with genetic-related problems has increased dramatically – and is still increasing – in the developed countries of the world, due largely to the success of medicine in decreasing other types of disease. In

particular, genetic disease is a leading cause of death amongst pediatric patients. If the genes involved in various genetic diseases can be found, further studies will lead to an understanding of how those genes contribute to genetic diseases: it is claimed that the ability to detect these abnormalities will greatly reduce human suffering. Whether this statement is true is a topic that will be addressed in the next issue of the Bulletin.

Potential Benefits

Supporters of the HGP have also pointed to a number of other specific potential benefits of the program. Generations of biologists, they say, will be provided with detailed DNA information that will be the key to understanding the structure, organization and function of DNA in chromosomes. In addition, the development of technologies will revolutionize future biological explorations: the technologies, databases and biological resources developed in genome research will have an enormous impact on a wide variety of biotechnology-related industries in fields as diverse as agriculture, energy production, waste control and environmental cleanup.

Medical practices, it is claimed, will be radically altered when powerful new clinical technologies based on DNA diagnostics are combined with the information emerging from genome maps. It is hoped that emphasis will shift from treatment of the sick to a prevention-based approach. Researchers will be able to identify individuals predisposed to particular diseases, and will devise novel therapeutic regimens based on new classes of drugs, immunotherapy techniques, avoidance of environmental conditions that may trigger disease, and the possible replacement of defective genes through gene therapy. The ability to sequence DNA directly and quickly will revolutionise mutation research by allowing researchers to study directly the relationships between disease and exposure to various agents.

Data from these studies could be coupled with medical information to diagnose disease onset and develop therapeutic strategies.

ELSI: The Ethical, Legal and Social Implications Program

Naturally enough, the HGP is not without its critics. There are claims that it has become the modern "Holy Grail", and that DNA has become, in popular culture, the secular equivalent to the human soul, seen as being independent of the body and immortal. The HGP's funding and implementation have also raised concerns about the adverse effects that HGP might hold for society generally.

James Watson, the co-discoverer of

"DNA has become, in popular culture, the secular equivalent to the human soul"

DNA, urged that HGP researchers acknowledge and address these public concerns. This led to the formation of a subsidiary research program, administered by HGP, known as ELSI, or the Ethical, Legal and Social Implications Program. ELSI sponsors research by social scientists, legal scholars, philosophers and theologians. It has a fourfold mission: to anticipate and define the implications expected of HGP for individuals and society; to examine the ethical, legal and social consequences of mapping and sequencing the human genome; to stimulate public discussion of the issues identified; and to develop policy options to ensure that the information produced by HGP is used for the benefit of the individual and society.

In addition, the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) International Bioethics Committee, has prepared a draft *Declaration on the Human Genome and Human Rights*, to be considered by the General Conference of UNESCO in November 1997. The *Declaration*, although drafted in very general terms, addresses many of the key issues

raised by critics of the Genome Program.

The Australian Research Council has also awarded a large research grant for an analysis of the legal and ethical implications of human genetic research. The current state of the Australian regulatory system will be assessed, the need for reform considered, and where necessary, recommendations made. This research project, focusing on Australian perspectives, is expected to be completed towards the end of 1998.

Ethical Issues: Current and Future

Two types of potential problems have been identified with regard to the HGP. The first concerns ethical and moral issues of the program itself, and genetic research on humans generally. The second concerns the ethical and legal effects of the research in the areas of medical diagnosis, the use of resultant information, and ownership of information: in other words, moral concern about the use of the information that the project is expected to generate.

These specific legal, ethical and moral issues, raised by the HGP, will be discussed in the next issue of the Bulletin.

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Anna Stokes

Some Ethical Concerns of Prenatal Diagnosis

Many pregnant women undergo a prenatal test to see if their unborn baby is healthy. This article discusses some of the ethical dilemmas they need to consider before having the test.

Congenital Malformations

Australian figures for 1994 show 1.6% of all fetuses and newborn babies within four weeks of birth had a major congenital abnormality, i.e., one that is lethal or significantly affects an individual's function or appearance. Victoria's rate for 1994 was 3.5%: it was higher than the national figure because different inclusion criteria were used. Chromosomal abnormalities occur when there is a net gain or loss of a chromosome in the offspring. In the case of Down's syndrome there are three instead of two copies of chromosome 21, hence its name *trisomy 21*. This is *not inherited* from the parents, but occurs during fertilisation when the egg (usually) or sperm has two copies of chromosome 21 instead of one copy due to an error in the formation of the egg or sperm.

Mendelian or inherited single gene defects occur in about 1% of births. Only about 35% of birth malformations are known to be inherited. The other 65% result from errors in the developmental process from fertilisation due to the combined influence of environmental and/or genetic factors. The risk of a live-born child with Down's syndrome increases with maternal age from 1 in 1923 at 20 years of age, to 1 in 1205 at 25 years, 1 in 885 at 30 years, 1 in 365 at 35 years, 1 in 109 at 40 years, 1 in 32 at 45 years and 1 in 12 at 49 years.

Current Procedures for Prenatal Diagnosis

Advances in diagnostic testing techniques, coupled with the advent of legal abortion in most countries over the last 25 years, have increased pressures to extend the availability of antenatal diagnostic testing. The most widely used and safest antenatal diagnostic test is ultrasound imaging which requires no particular indications. It is usually performed at about 16-20 weeks gestation, and in expert hands may detect 70-80% of all major malformations. It is generally agreed that it is quite safe for both mother and fetus. Problems may arise in interpreting the results, especially by a less experienced operator, resulting in failure to detect abnormalities (false negatives) or the diagnosis of an abnormality where there is none (false positive), which may lead to the abortion of a healthy child.

From the 14-15th week of gestation amniocentesis may be performed. It involves the withdrawal of 15-20 mls. of fluid from the amniotic cavity under ultrasound guidance by means of a syringe. This fluid contains cells shed from the fetus' skin and other fetal tissues. They are genetically identical to the rest of the fetus' cells and can be grown in culture for chromosomal examination or for DNA analysis for a variety of genetic disorders. There is a risk of about 1% of miscarriage of a healthy fetus as a result of the procedure, usually due to infec-

tion. Expert operators have only about a 0.5% miscarriage rate above the normal background rate during the same period of pregnancy. Some practitioners of amniocentesis advise mothers who do not intend to have an abortion, even if a major genetic defect were discovered, to forego having this test on account of its risks for the life of the fetus. It is a reliable and accurate diagnostic test for a wide range of congenital and genetic abnormalities.

From the mid-seventies onwards cho-

"CVS poses a risk to the life of the fetus of about 2%"

ionic villus sampling (CVS) made its entry into medical practice, and it is usually performed between 9 and 12 weeks of gestation. It involves taking a sample of placental tissue which is usually genetically identical to the cells of the fetus. CVS tests have greater risks of error than amniocentesis because not all placental tissues are equally representative of the genotype of the fetus. CVS poses a risk to the life of the fetus of about 2%, depending on the expertise of the operator and the number of attempts needed to obtain the sample. Fetal blood may also be drawn from the fetal cord under ultrasound guidance through a syringe and be used in antenatal diagnostic testing for a variety of congenital abnormalities. The risk of fetal loss is about 3-5% in this technique. It may one day be possible to isolate fetal cells present in the ma-

ternal bloodstream. This form of test would pose no risk to the mother or the fetus.

Therapeutic Benefits of Antenatal Diagnosis

The allaying of a mother's distress with the news that her baby will most likely be born free of a major congenital defect is a great benefit for mother and fetus. If defects are detected, appropriate genetic and pastoral counselling should be provided. This information may also be of benefit to the antenatal clinicians for the better management of the pregnancy. It is possible to provide direct therapies for some conditions discovered by amniocentesis. It enables an evaluation of pulmonary immaturity, fetal haemolysis and anaemia which may be treated *in utero*. Once detected, respiratory distress syndrome in the premature fetus can be prevented by administering maternal corticosteroids. Clearly prenatal diagnosis can be of benefit to the health of the fetus.

Ethical Evaluation of Antenatal Diagnosis

From the outset it must be stressed there is *no duty* for pregnant women to have a prenatal diagnostic test unless this is needed for the therapeutic benefit of the fetus. Before undergoing *any* diagnostic test people have a right to be adequately informed about its purpose, its associated risks for oneself and family, the available treatment options and their likely outcomes. Pregnant women need practical freedom to consent without any undue influence from health care professionals or social pressure which favours antenatal testing, followed by selective abortion based on a utilitarian cost-benefit calculation. Women need to consider in advance all the relevant implications and risks of having, and not having, the test if a major abnormality were detected and the more usual case of the fetus being found to be healthy. Genetic counselling and pastoral support according to need should be provided with great sensitivity. The utmost care

must be taken to avoid directly or indirectly trying to persuade a pregnant woman to have recourse to abortion if the test is positive for a congenital defect. Even the genetic counsellor should be careful not to allow body language to betray abhorrence of having to care for a defective child, and so influence a person to choose termination against their better judgement.

Nature is not perfect but there is scope for the morally responsible exercise of preventive medicine. There is no ethical difficulty in principle with prenatal diagnostic testing. The benefits of knowing the health of the unborn child for the mother and the family are considerable, whether the prospects are good or not. In some cases treatments and therapies may be available which could be of benefit to the fetus. A prenatal diagnostic test could not objectively be justified for routine use if it had a risk of 0.5%-1% or more of inducing a miscarriage, unless there were proportionate therapeutic benefits for the fetus and/or mother. Admittedly there is scope for different evaluation in these cases, especially if the mother is experiencing great distress. Variations in the evaluation of the risks involved could all be considered reasonable without any being unreasonable. In the final analysis the risks, which are a part of life, must not be disproportionate to the benefits anticipated by undergoing the antenatal test.

To the extent that a link is established between having the test and a decision to abort if a congenital abnormality is verified, it would be unethical to have the test. The same would apply to any doctor or genetic counsellor who tries to persuade a woman to have the test for this purpose, or who made consent to abortion a condition for having the test. But usually the decision to abort is not made before having the test and receiving the results. This decision is more likely to result from the inability of the parents to come to grips with the long term implications of a defective child, as well as from advice received

from friends or the genetic counsellor. Ante-natal diagnosis can be made to serve good purposes instead of practically becoming "search and destroy" missions.

It would be wrong to put pressure on a couple not to have any children once they find out they have, say, a 1 in 4 risk of having a child affected by a serious genetic defect. There are good reasons for such a couple to think through their options very carefully before deciding to have children. They need to bear in mind the responsibilities that may be theirs to shoulder for years. I would stop short of saying there was a moral duty to avoid having any children once the facts were known. From the ethical perspective, nevertheless, selective abortion is not an option, and the parents should be prepared to care for affected children with love and to the best of their ability.

"from the ethical perspective selective abortion is not an option"

In the case of people who are known carriers of a recessive genetic abnormality and who are contemplating parenthood, they should certainly consider the implications of marrying a partner who is also a known carrier. While people in our culture are motivated by love to marry, this need not exclude the consideration of other relevant factors when choosing a marriage partner. The health of the future children of the marriage would be one such important factor. If they choose to marry, they should be satisfied both are committed to support and care for their children, regardless of any eventual inherited genetic defects. It goes without saying, if they marry a non-carrier, none of their children will be affected by one of the parent's recessive genetic defect.

Carriers of a serious dominant genetic disease need to consider whether they should assume the responsibility of marrying and having children with a 1 in 2 risk of being affected. It is not a question of it being better to exist or not to exist. An ex-

isting child, genetically defective or not, is of inestimable value. It is not a question of telling a defective person they should not have been born – this would be extremely offensive. Responsible family planning does not imply some existing children ought not exist. It does imply, however, that a couple should not choose to conceive unless they are generously prepared to love and raise their children with morally responsible dedication. Before making their decision couples in this situation would need to be adequately informed of the relevant facts, risks and degree of suffering their future child is likely to endure. Similar considerations would apply to a couple who know they have a significant risk of having a child with a serious viral infection such as HIV. If it were certain or most likely the child would be doomed to endure much suffering, I think the couple should choose not to have children. To act otherwise would be to assume an awesome responsibility.

For those who do not believe the unborn child is a person and are guided in moral decision making by utilitarian considerations, the observance of absolute respect for human life from conception will weigh less in their deliberations over the ethical implications of antenatal diagnosis performed to prevent the birth of an abnormal child. Most of the ethical considerations I have outlined above would most likely be acceptable to them. I do not think anyone would dispute the benefit that would result from lowering the incidence of congenital disease in the community. Attention would need to be given, however, to how the prevention of disease may be achieved sensitively and without hurt-

ing people in the community who are disabled. The long term impact of the deliberate taking of the lives of some unborn children so that other children may enjoy lives free of congenital diseases needs to be considered. No matter what the motive, purpose or benefits, the social approval of the deliberate taking of innocent human lives before birth is a cause of great concern. The requirement of equal justice for all means there should be no arbitrary discrimination on non-medical grounds for the use of antenatal diagnosis and genetic screening.

“social approval of the deliberate taking of innocent human lives before birth is a cause of great concern”

I conclude with Pope John Paul II's statement on prenatal diagnosis in his Encyclical Letter *Evangelium Vitae*, *The Gospel of Life*, n.63:

Special attention must be given to evaluating the morality of prenatal diagnostic techniques which enable the early detection of possible anomalies in the unborn child. In view of the complexity of these techniques, an accurate and systematic moral judgment is necessary. When they do not involve disproportionate risks for the child and the mother, and are meant to make possible early therapy or even to favour a serene and informed acceptance of the child not yet born, these techniques are morally licit. But since the possibilities of prenatal therapy are today still limited, it not infrequently happens that these techniques are used with a eugenic intention which accepts selective

abortion in order to prevent the birth of children affected by various types of anomalies. Such an attitude is shameful and utterly reprehensible, since it presumes to measure the value of a human life only within the parameters of "normality" and physical well-being, thus opening the way to legitimising infanticide and euthanasia as well.

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