TRINITY LECTURE 3 - Stem Cell Research

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Preacher: Denise Cooper-Clarke

[0:00] It's our pleasure to welcome Dr. Denise Cooper-Clark to be with us tonight, speaking on the subject of a Christian response to stem cell technology and human cloning.

Denise has degrees in both medicine and theology, and she's just completed her PhD on the topic, The Moral Distinction Between Killing and Letting Die.

She works as a medical ethicist where and when she's asked to. She is a visiting lecturer at Ridley College, and she's a board member of the Centre for Applied Christian Ethics associated with Ridley College as well.

She's a member of St. Colm's Anglican Church in Hawthorne, and she's the mother of three and a grandmother-to-be. So it's a great privilege for us to have Denise here tonight.

Please welcome her with me. Thanks, Megan. Well, human embryonic stem cell research and cloning has created an enormous amount of fuss.

[1:11] To a certain extent, you might think the fuss is over, because both the federal government and the Victorian government have legislated on this issue to allow embryonic stem cell research to go ahead, and now most recently also attempts at human cloning, so-called therapeutic cloning.

But that doesn't mean that the issues have gone away, because the government has made a decision. People are still talking about it.

And even, I don't know if you noticed in the paper this morning, there's been a new development. I'm going to talk about that later. So the first reason why there's so much fuss, I guess, is because these technologies promise a great deal.

People talk about cures for diseases like Parkinson's, Alzheimer's, and diabetes, maybe even a cure for paraplegia.

So all the most terrible diseases you can think of, people are saying that stem cell research must go ahead in order to find cures for these. And of course, our natural response is, well, of course it would be a very good thing if we could find cures for these disease.

[2:31] In fact, potentially most diseases caused by either degeneration or faulty or damaged cells could be treated using a stem cell therapy.

It's been said that it could potentially revolutionise medicine. There's also a lot of money to be made, obviously, by biotechnology companies and drug companies if they come up with these new treatments.

So the stakes are very high. People weren't prepared to say, no, we shouldn't do this. In fact, they've said, let's go ahead, we must do this.

The second reason why I think there's quite a bit of fuss about these new technologies is due to lack of understanding. I was quite horrified hearing some of the politicians talk about this.

They obviously, well, to me, they didn't seem to really have a very good grasp of the science. People often confuse stem cell techniques with cloning, and they also often get confused between different types of cloning, reproductive cloning and therapeutic cloning.

[3:41] We'll talk about that later. They also get confused between the different types of stem cells. There's very important differences between different stem cells.

And then the third reason there's a lot of fuss about all this is that, especially, but not only when we're talking about doing this in human beings, it raises all sorts of ethical questions.

And, well, particularly when we're talking about humans. Stem cell research, some stem cell research, and therapeutic cloning involves destroying human embryos.

And many people think that this is not something that we should do, or at least not do lightly. In fact, it has been illegal in most countries until very recently.

It raises questions about the value of human life and how we should treat very early forms, the very earliest forms of human life.

[4:48] And particularly raises the question, which Paul has already said the Bible doesn't answer, which is the question of when the life of a new human individual begins.

Some of these questions have already been raised, of course, raised in other issues such as abortion and artificial reproductive technologies, but raised in a particularly acute way when we're thinking about stem cells.

The final reason I think that this issue has caused so much controversy in the community and so much heated discussion is that it highlights that in Australia and probably in most of the Western world, we don't have a common moral language with which to discuss these issues.

So if you were wanting to talk with someone about maths or physics, you have to have some language that you both understand, that you can communicate with.

But many people feel, and I think this is right, that in today's society, in ethics, we actually don't have that language.

[6:02] We talk past each other. We're not actually speaking the same language. We don't even have a few basic rules about how to make an ethical argument. And of course, if that's the case, we can't really convince each other.

We can only shout at each other. So let me see if I can explain some of the confusing things in this discussion so that at least we know what we're talking about.

I'd like to start by just talking about the basic science behind stem cells and cloning. And if there are any molecular biologists or geneticists in the room, I think you'd better leave because it's going to be really simple.

The thing about the way our bodies are made that leads to all sorts of possibilities is that every cell in our body contains all the information in its DNA, in its chromosomes, that's needed to make every single cell in the human body.

So a cell from your skin knows how to make liver cells, blood cells, any type of cell. All the information is there.

[7:21] But normally, of course, it doesn't. It doesn't. It just keeps on making skin. And it goes on dividing into more and more of a particular type of skin cell.

It has differentiated or specialised. And it needs to do that because we don't want our skin to suddenly start making liver or brain or blood.

So most of its DNA is actually switched off. It's quiet. It's not being used. Only a small part of it is being used, that part which is responsible for making skin.

In fact, if it weren't that way and our cells just started dividing in an undifferentiated way, that would lead to all sorts of problems.

And that's partly the way we might understand cancer. A chaotic multiplication of cells. But nevertheless, this fact about cells is what's behind people starting to think, well, if all the information is there, what if we could find a way to switch it on, to switch all of it on?

[8:37] We could potentially make a whole new human being from just one skin cell because all the information is there. So, what are stem cells?

We said that most cells are specialised and cannot become anything other than what they are. But there are exceptions. And these exceptions are the stem cells.

They're called stem cells. They take their name from the stem of a plant which can branch, divide, become other things. All the various parts of a plant, the leaves, the branches, the flowers, originate from the stem.

So, a stem cell is a type of cell from which many other specialised cells develop. They may be more or less versatile.

The technical word is plastic in terms of how many different types of cells they can become. And so, there are three varieties of stem cells in terms of how plastic or versatile they are.

[9:52] Totipotent stem cells can become a whole new embryo and placenta. Totipotent stem cells only occur in an embryo of about one or two days.

pluripotent stem cells can become any type of cell that is heart, liver, bone marrow, etc.

But not a whole new individual. And then multipotent stem cells are more limited still. They could become any type of liver cell or skin cell or bone marrow but probably but probably not switch from one type to another.

So, we've got these three different types of stem cells in terms of their versatility. Now, the stem cells that people often talk about that are the most controversial ethically are embryonic stem cells.

They're called embryonic stem cells because they come from an embryo. an embryo that is only between five and ten days old. Five and ten days old.

[11:07] So, we're talking about an embryo that if it were inside a woman she wouldn't even know she was pregnant yet. This is very early. These stem cells that are derived from an embryo of this age are pluripotent.

they can become any type of tissue but they couldn't become a whole new baby. So, that's embryonic stem cells. The other main type of stem cell are the adult stem cells which can come from anyone either an adult or a child who has been born.

And they are found in a variety of tissues particularly easy to locate in blood and bone marrow and skin a bit more difficult to locate in the brain and other tissues.

You may have heard of stem cells from the umbilical cord blood and you probably think they're embryonic stem cells. They're actually adult stem cells.

So, when people save the blood from their newborn baby's umbilical cord they are saving a store of adult stem cells. And of course that's a very easy and convenient way to get hold of those cells.

[12:36] The problem with most other kinds of adult stem cells is that they are hard to get hold of. Um, and this is why many people say adult stem cells are less useful more because they're not that easy to get apart from as we've said bone marrow and umbilical cord.

But adult stem cells probably do exist for every type of tissue and we need them in our bodies to keep on regenerating our skin our blood our nervous system and so on and to repair damage when it occurs.

Adult stem cells are less versatile less plastic than embryonic stem cells. They are multipotent not pluripotent.

they can not probably this is still controversial they probably cannot if say it was a bone marrow cell probably not turn into liver or brain although experiments are happening as we speak and some people are thinking um that adult stem cells may be more versatile than we've previously thought.

but generally this is one of the arguments for saying we need to do embryonic stem cell research because adult stem cells are not as good.

[14:08] And then there's a third and less well known type of stem cell which is a fetal stem cell also called a germ cell taken from the ovaries or testes of a fetus.

The fetus might be aborted or miscarried or surgically removed. These stem cells are of the more plastic or versatile type that is pluripotent same as embryonic stem cells.

I guess it's obvious that the ethical problem for people with stem cells is going to be with the embryonic stem cells and possibly with the fetal stem cells not the adult stem cells.

Because the embryo has to be destroyed to get embryonic stem cells. So let's think now about how we could use these stem cells.

How would we actually get some therapies? How would we get a cure for Parkinson's disease or Alzheimer's using stem cells? Stem cells have some particular properties.

[15:20] We've already said they can produce lots of different kinds of cells. but they also have the capacity to multiply, some say indefinitely, to produce millions, millions of cells.

So theoretically you would only need one cell to begin with to produce a whole new tissue or organ. Embryonic stem cells also have the advantage that they can be propagated or multiplied in vitro, that is in a dish, in a glass dish in the laboratory, indefinitely.

And so people talk about embryonic stem cells as being immortal, immortal cell lines. They can be made to divide without differentiating, that is just keeping on dividing into more stem cells.

And so the idea is that in the laboratory we'll be able to build up banks of millions and millions of these cells. So far we haven't been able to do this with adult stem cells.

That is, it's not possible to take one or two adult stem cells and keep on multiplying them in a laboratory. So that's another reason why some people would say that adult stem cells are not as potentially useful as embryonic stem cells.

[16:50] On the other hand, adult stem cells are already being used in various therapies, although we may not think of it in this way, but whenever anyone has a skin graft or a bone marrow transplant, effectively what is happening is their own stem cells are being put back into them and used to produce new tissue.

Now, we get to the sort of confluence of stem cell research and cloning.

We've said that we can produce tissue for transplantation from adult stem cells, and we already do this in relation to bone marrow and skin. But it's much more difficult if you need a liver transplant or a heart transplant to use adult stem cells.

So you might say, well, why couldn't we use embryonic stem cells? Well, the problem is if you just use any old embryonic stem cells, they wouldn't be matched with your body.

so how can we get embryonic stem cells that are tissue matched with us so that our body won't reject them?

[18:15] We know already about the dangers of rejection of tissue. When you're given a blood transfusion, a kidney, a liver transplant, it has to be carefully matched.

And that's why using adult stem cells, there's no problem with rejection. What could we do to embryonic stem cells to make them match us?

And this is where therapeutic cloning comes in. What is cloning? Cloning is actually a very common technique. In fact, I would say probably all of you have done some cloning in your time.

How many people here are gardeners? Have you ever taken a cutting of a hydrangea or a rose? Well, then you've cloned. That's all it is. In fact, it comes from the Greek word for twig.

And plants are often reproduced using cloning. But it doesn't happen very often. It has never happened as far as we know with people.

[19:22] And certainly doesn't happen naturally. Up until now we thought it couldn't happen with animals or people. But that was before Dolly.

Dolly the sheep, cattle have been cloned, and more recently a very cute Afghan hound. For people who like dogs.

So how do we do this? How do we clone an animal, not just a hydrangea? Cloning involves the use, and you would have heard the term being thrown around at the time of the debates of somatic cell nuclear transfer, in which the DNA of an adult cell, a somatic cell, a cell from the body, is altered somehow.

Because remember, if you took the cell from your skin, it would be differentiated. Only that portion that was necessary to make skin would be switched on. So the idea was people take this cell, this skin cell, and they do something to it, usually zap it with electricity or something, sorry to be so technical, to undifferentiate it.

So basically all the DNA is now switched on. It doesn't know it's a skin cell anymore, doesn't know what it is, it could be anything. So then you take the nucleus of that cell, and you put it into an egg from which the nucleus has been removed.

[21:10] If you're going to try and clone a human, you use a human cell and a human egg. Although the article in the paper this morning said that in Britain now the go-ahead has been given to clone a human cell into an animal egg.

Because of course human eggs are hard to get. Animal eggs are reasonably easy to get. It's very interesting to think what would happen.

Because these animal-human hybrids are not going to be grown up into a new individual. They're just going to be used to get the stem cells.

eggs. And they're effectively going to be 98% human because all of the genetic material, except for a very small amount, comes from the nucleus of the human cell.

But a small amount of it is coming from the egg. So I think that's really interesting that the go-ahead has been given for that because you might remember that when this topic was being debated in the federal parliament, the possibility of human-animal hybrids was raised and there was quite a lot of discomfort about that.

[22:31] But people in the UK have decided that it's okay. So we've cloned our cell.

We've now got an egg with a nucleus in it that if I was the one being cloned, for instance, it would have all my DNA, it would know to make Denise.

And then what we do is we switch on the DNA again and effectively now this thing, this cell, thinks it's an embryo, thinks it's going to make a baby.

And it starts to behave just like a fertilised egg, even though no fertilisation has taken place and no sperm has come near it.

Let me imagine that I have created such an embryo which is identical to me, almost. Now I have got the perfect thing from which to extract embryonic stem cells, which are genetically identical to me, which I could use to make tissues, which could be transplanted into me because my body thinks it's me.

[23:48] My body won't reject these cells because they're perfectly matched. So you can see the possibilities here for therapy and why people are so excited about it, that somehow we would have the capacity to tailor make stem cells and potentially all kinds of tissues for transplantation for every individual perfectly matched to them.

So the ethical issues. Almost all public ethical discussion takes place at the level of applied ethics, particular issues.

The people don't generally say what are their underlying assumptions, what ethical theory are they using. And usually, not always, but usually the disagreement arises because we're actually coming at it from a different way of operating ethically.

To use the technical term, we're using a different normative ethical theory. A normative ethical theory just addresses the question, what makes something right or wrong?

What makes something right or wrong? There are only three basic theories. And the one dominant in Australia says that X is wrong if it produces, overall, more harm than benefit.

[25:25] And this theory is called consequentialism, and its most famous version is utilitarianism, associated with Professor Peter Singer, but also many other ethicists and particularly bioethicists in Australia today.

So no action is right or wrong in itself, but we determine whether it's right or wrong by the consequences that it promotes. In unusual circumstances, things that we normally think of as wrong could in fact be right, not only permissible, but in fact obligatory.

Murder, theft, torture, because they're not right or wrong in themselves, it all depends on what are the consequences.

There are many critiques of consequentialism, including the observation, called the cane-toed principle, that we often cannot predict what the consequences of an action might be, especially the long-term ones.

consequences. But consequentialism can also be quite counterintuitive. Generally, doing the right thing has good results, and we would say as Christians that is because God made the world.

[26:46] So doing the right thing generally has good results. But sometimes doing something that people would consider absolutely wrong may also give good results.

And the most striking example of this that was put forward by a famous consequentialist is the so-called organ lottery.

He said what makes something right or wrong is whether overall there are good consequences or bad. Clearly, human lives are good, and so if the consequence of a particular action was that a hundred lives could be saved at the expense of six, a hundred lives is better than six, we should do it.

And so he proposed that everybody should go into a lottery, and if your name came up, you'd be sacrificed and your organs donated.

In that way, your life could save up to 20 other lives. Clearly, that's the right thing to do from a consequentialist point of view, because the consequences are much better of doing it than not doing it.

[28:11] It's a very good example because most people feel, hmm, that can't be right. There's something actually wrong about killing people, even to save lives.

But this is what consequentialism says. So if consequentialism can justify killing an adult to save a number of lives, it can certainly justify killing an embryo to save potentially thousands of lives.

If you just do the sums, it's very clear. So running counter to consequentialism and completely incompatible with it are the non consequentialist ethical theories which claim that there are some actions which should never be done, just never be done, no matter what good consequences might come or we might say the end does not justify the means.

consequences. And I think this basic difference between a consequentialist approach, which is very dominant in Australia, although not to the extent of promoting the organ lottery, and a non-consequentialist approach, this difference is what lies behind much of the disagreement about the use of human embryonic stem cells.

And it explains why no amount of discussion, rational or otherwise, will resolve the issue. Because for a consequentialist, the possibility of these great medical benefits, treatments for diabetes, Alzheimer's, Parkinson's, paraplegia, and the list goes on, self-evidently outweigh the harm of destroying some five to ten day old human embryos.

[30:12] There is simply no contest. Whereas, from a non-consequentialist perspective, if an action is wrong, then all the projected benefits from it are strictly irrelevant.

And at this level, it's clear why no amount of argument will change anyone's mind. Probably the type of non-consequentialist ethical theory that you're most familiar with is the one that says that an action is right if and only if it is in accordance with a moral rule or principle.

So, as Christians, we might ask, does destroying an embryo come under the moral rule, you shall do no murder? or the general principle which Paul has explained tonight about the high value that the Bible puts on human life, even fetal life.

And sometimes people call this the doctrine of the sanctity of human life. But as Paul has alluded to, while you may be a very firm believer in that principle, the question still remains, when does the life of a human individual begin?

Is this embryo, between five and ten days old, covered by that rule? Does it fall within that rule? And there are a range of possible answers to the question, when does the life of a human individual begin?

[31:54] There's a very big range if you look at ethicists in general. of answers to that question. But even amongst Christian ethicists, there is not agreement, because scriptures do not give us a definite answer.

Now I know that there are certain proof texts which are often cited in this debate, and probably the most well-known one is Psalm 139, which talks about God knowing us even when we are being formed in the womb.

And there are many other, particularly in the Psalms, references to God knowing us and forming us in the womb. But what that tells us is, yes, God knows us in the womb, doesn't tell us when that life actually starts.

And how could we expect it to tell us when that life actually starts, when the biblical authors know nothing about embryos or over or fertilization or any of these technical details.

And they're not particularly interested either because it wasn't a question for them. So if we're going to ask this question, when does the life of the human individual begin?

[33:17] there are really only two answers I think that we can consider from a Christian point of view. The first and most conservative view, and the view that you certainly would have got if Nicholas Tonti Filippini had been speaking to you tonight instead of me, is that the life of a new human individual begins at fertilization.

Accordingly, the use of embryonic stem cells, is morally wrong, since it destroys a human individual, effectively the same as killing a fetus or killing an adult.

Now when the embryonic stem cell debate began, you might remember that the initial permission which was given by the federal government was for the use of existing embryos.

I thought John Howard was quite clever about this because there was quite a lot of resistance at that time to deliberately creating embryos in order to destroy them, to extract their stem cells.

But he said, and the argument was, there are lots of embryos, frozen embryos, just sitting around in laboratories already. embryos, these embryos have been produced in the course of IVF and they are spare.

[34:49] That is, they will not be used. The parents may have created ten embryos but they're not going to use them all. So after five years, by legislation, they have to be destroyed anyway.

So the argument was rather than just destroying them, rather than just letting them defrost and die, why not make some use of them and extract the stem cells and do research on those stem cells.

And I guess you could regard that in a similar way to taking the organs of someone who's been in an accident, someone who's going to die anyway, and you say, well, we can take their organs with permission.

So I think that initially that prospect of taking the stem cells from existing embryos was not as problematic as what is in fact happening now.

Because now the go-ahead has been given not just to use spare embryos, but actually to deliberately create embryos solely for the purpose of destroying them, to extract their stem cells.

[36:13] And I think that's quite a different thing. But of course a very conservative view would say even a spare embryo, something which is going to be destroyed anyway, we should treat with respect and we should not use it, we shouldn't just treat it as something to be used.

So not everybody would be happy with even using spare embryos. So that's the first view, that human life begins at fertilisation, day one, and therefore we cannot do anything to embryos.

Against this view is the view that human life, the life of a new human individual begins around day 14.

If you take this view, then it's permissible to destroy the embryo, to extract its stem cells, because it happens before them. So your attitude to the use of embryonic stem cells really comes down to do you think life begins at day one, or do you think it begins at day 14?

Well, why would you think it begins at day 14, you might ask. Well, there are three reasons. Firstly, twins can occur any time up until day 14.

[37:48] So you've got a single embryo, it can split and become two. So the argument goes, well, how could that be a new human individual if it then becomes two or even three?

So some people would say that in that first 14 days, what we have is really just a collection of dividing cells, which can become one individual but might become two or three.

Something else happens at 14 days. Something called the primitive streak becomes apparent in the embryo when the cells of the embryo are differentiated into three basic tissue types.

babies. And the other thing which happens at 14 days is the completion of the implantation of the early embryo into the uterine wall.

See, not all embryos, even in nature, become babies. Many of them are lost before the 14-day stage. And for people who think that an important aspect of being human is tied up with relationships, then they will say it's when that embryo establishes its relationship with the mother that it becomes a new human individual.

[39:26] And so Archbishop Peter Carnley is probably the most well-known advocate of this view that 14 days is the time at which a new human individual begins.

And so he didn't have a problem with embryonic stem cell research. Just as an aside, of course, there are many other different views about when the life of a new human individual begins, ranging from 40 days, which is the view of some Jews, to quickening, which is when the mother starts to feel the baby moving, around 18 to 20 weeks.

A very popular view amongst bioethicists is that it is around 24 weeks when consciousness begins. And then, of course, the old fashioned view viability, that is when the baby could be born and live without, well, when the baby could be born and live.

Because that's changing all the time with modern technology. And then a very old fashioned view, that the life of the individual begins at birth, when breath enters.

And many Jews, for many Jews today, they believe that the fetus has different moral status to a baby because of this thing that happens at birth, the breath enters.

[41:07] The most radical view is that a new human individual doesn't begin until somewhere between one and two years of age, when the infant becomes a person capable of having subjective preferences.

But we don't need to decide between all those different views to think about embryonic stem cell research. We really only need to decide between the day one view at fertilisation and the day 14 view at implantation.

I'm just going to suggest that in fact, this may not be a very helpful way to approach the question. because it is impossible to be absolutely sure which of those two views is right.

I mean, you may have a very definite view that one is a better view than the other and that's okay, but you can't actually prove it and you certainly can't prove it from the Bible.

So I don't think it's all that helpful a question. It forces us also to make a more or less arbitrary choice and to nominate one point in what is actually a continuous process of development.

[42:25] It means that we must regard the destruction of an embryo, if we take the 14-day view, for instance, we have to regard the destruction of an embryo before that point as of no moral significance at all, but then suddenly, after that point, it's the same as murder.

and yet many people wouldn't see the life of the fetus or the value of the fetus in quite those terms.

So many people sense intuitively that it's morally worse to destroy a fetus, say, at 12 weeks, as in an abortion, than it would be to destroy a five-day embryo.

And even more so, many people feel much more uneasy about a late-term abortion, that is, an abortion at, say, 28 weeks, than an early one at 12 weeks.

And that kind of intuition accords with the notion that the moral significance of the embryo increases gradually over time, in parallel with its physical development.

[43:42] If we have that view, we avoid the dualistic idea of ensoulment occurring at a particular discrete point in time. Now, you might think, from this, that I am suggesting that there's no problem with embryonic stem cell research.

I actually don't think that. I think that the fact that there is doubt, means we have to be very careful. So, if we don't know for sure when the life of the new human begins, because we do know that human life is so precious to God, then we really need to give the embryo the benefit of the doubt.

And we should act, not act as if human life begins at fertilisation, even though we can't prove that that is the case, just because we have so much respect for human life.

So, we've looked at two normative ethical theories now. We've looked at a consequentialist theory, which says, well, we just work it out on the basis of the harms and the benefits. we've looked at a rule based theory, which says, what principle is involved here?

Does destroying embryos violate a moral rule or principle? But there is a third way of doing ethics, a different normative ethical theory called virtue theory.

[45:25] And virtue theory focuses on the character of the person who is acting, not so much on what they do, but the sort of person that they are.

Virtue theory is really interested in people's roles and their relationships and their responsibilities. And so a virtue theory approach would focus on parents' responsibilities to their children, even if those children are only embryos.

And the fact that those embryos, even though sometimes they're sitting on a bench in a laboratory, are in fact in relationship with others.

Parents have particular responsibilities to protect and care for their children. So to approach this from a virtue theory aspect would say, we would ask, what responsibilities do we have in our various roles and as a society to human embryos?

Or what virtues or vices would be evidenced in the practice of cloning, therapeutic cloning? Virtue theory emphasises that moral acts do not occur in a vacuum, but in the context of relationships.

[46:49] And the question becomes, does a good parent sacrifice their only child, or their child, I should say, their own child? In fact, in the case of cloning, the relationship is not that simple because it would also be possible to think of this clone as your identical twin.

do you sacrifice your identical twin or your child in order to gain even your whole life? The Christian narrative suggests that one should be prepared to risk one's own life in order to protect the life of a neighbour.

And if a neighbour, how much more a child or brother or sister, no matter how young they are. Therefore, it would seem to me from this point of view also that it would be morally culpable for anyone to deliberately seek to create a clone of him or herself for the express purpose of destroying it, or him or her, to benefit oneself.

The question is often asked though, isn't it cruel to oppose embryonic stem cell research and therapeutic cloning? The question is often put, with all these benefits in view, surely it's just moral quibbling to argue about the status of the embryo or even more ethereal arguments from virtue theory.

I think the first response to that is to challenge people about consequentialism. Are we really going to say that the end justifies any means?

[48:47] The second thing to say is that to oppose embryonic stem cell research is not to oppose stem cell research in general, and it's not to oppose the search for therapies for all of these diseases.

In fact, if you look in the media, you'll see that there are all the time new reports of ways that adult stem cells are being used.

But there are also other possibilities. And now people are talking about using cloning, using somatic cell nuclear transfer, not into an ovum, but into existing stem cell lines.

And therefore, no embryo would be created, and there would be no ethical problem. And Alan Trounson, I think, has actually said that he thinks this is probably the way that therapeutic cloning will go.

I've already said that there's also the possibility of using adult stem cells. And then the third possibility, which is also being talked about in the media now, is the idea of just taking the mature cell from your skin, for instance, and zapping it, or doing whatever you need to do, so that it becomes pluripotent.

[50:18] itself, without ever seeing an egg or becoming an embryo. And all of these things are now being talked about as scientific possibilities.

So the claim that we must go ahead with embryonic stem cell research in order to save millions of lives, I think is a spurious claim. And maybe I'll leave it there, because I'm sure that you'll have some questions.

dangerous point. Well, we've got plenty of time for some questions, and if the question's loud enough for everyone to hear, I won't repeat it, but if I think that people would benefit from that, then I will.

Some questions for Denise. Yes, Paul. My question relates to, is there thought among the Christian medical fellowship?

I will certainly not in the Christian medical fellowship. Well, yes. Within our abortion think tank group, which is all Anglican women, this was one of the major questions, because the Archbishop set up the group to give him some advice about what to do about this proposed abortion.

[51:43] legislation that's coming in. And one view was, well, as you've expressed it, as Christians we can't impose our view on other people.

Of course we can't impose our view on other people, we live in a democracy. But anybody can and ought to express their view, and people can listen to it, and if they're convinced by it, then they're convinced by it.

So it's up to us as Christians to make a convincing argument. Knowing that we won't convince everyone, and even if things happen that we were opposed to, then we can at least say we said what we thought, we did our best.

And in relation to abortion, I think, because it's just not talked about very much at all, there's a certain political correctness about it.

but I think, in fact, in the general community there's quite a lot of unease at the amount, the number of abortions that are now taking place, and particularly the increasing number of late abortions.

[52:52] And I think as Christians, if we stand up and talk about that, there'll be quite a lot of other people who also will share that concern. Because, and particularly when we're talking about something as basic as the principle of the sanctity of human life, or respect for human life, that is a universal moral principle.

It's not just a specifically Christian idea. And many people feel very strongly about that principle. And that's a very powerful argument.

So I don't think as Christians we should be standing up and saying we want to turn the clock back, we want to ban all abortions. But I think we can try to appeal to people's unease about the number of abortions that are taking place, and some of the, we might say, very trivial reasons for which they are taking place.

And particularly I think also we could, we need to speak up for those fetuses who are being aborted because they've got some kind of disability.

And I think that there is in the community quite a strong will to prevent discrimination and to actually raise that issue to say do we really want to eliminate every child with Down syndrome?

[54:24] we're really saying it's worse to have Down syndrome. It's better to be dead than to have Down syndrome. And many other, what I would consider quite minor abnormalities, which are regarded as grounds for termination.

We're talking about abortion. We're supposed to be talking about embryonic stemmethers. Gary? There are.

And that's one of the reasons why some feminist groups oppose embryonic stem cell research and even some reproductive technologies because of the dangers of women's bodies being commodified and of women selling their eggs.

I could talk about human hens. Because, I mean, what sort of women would choose to sell their eggs? Poor women. That's right.

Yes. Of course, extracting eggs from women involves a surgical procedure that involves hyperstimulation of the ovaries with drugs.

[55:32] It's not without risks. So most of the eggs that are obtained and that have been used so far have been obtained incidentally, if you like, during the course of IVF treatment.

But if therapeutic cloning became a reality, a lot more human eggs would be required. And this is why I think they've turned to animal eggs, because they're much easier to get a hold of.

Everything must have been really clear. Yes. Well, let's thank Denise. Thank you. Thank you.

Thank you.