

SUICIDE IN MODERN IRELAND
NEW DIMENSIONS, NEW RESPONSES

Suicidal Thinking
Saturday Morning 13 November

ATTEMPTED SUICIDE: WHAT LIES BENEATH

Presented by: **Prof Paul Soloff MD**
Professor of Psychiatry, Western Psychiatric Institute &
Clinic University of Pittsburgh PA
Biological Psychiatrist studying Suicidal Behaviour

In the Chair: **Ms Teresa Mason**
Suicide Resource Officer Northern Area Health Board

Prof Kevin Malone: Good morning everybody and thank you for showing up so promptly, we appreciate that because we have a busy day. My name is Kevin Malone. I was here yesterday and we had a very exciting afternoon with President McAleese. Today I want to introduce you to our chairman for this morning session Ms Theresa Mason who is a Suicide Resource Officer for the Northern area Health Board amongst a lot of other things. But anyway, I'll hand you over to Theresa now. Thank you.

Teresa Mason: Thank you Kevin. I just want to say for a start off that I am delighted to be asked to share this session here today of what is a very important event in addressing the issue of suicide.

We have two very interesting speakers for you this morning but prior to introducing them I just want to make say that we are a very mixed audience here this weekend and we just wanted to make the point that people who attend a seminar like this can be effected by the issue of suicide within their own professional lives but also in their own personal lives. There is *Open Door Bereavement Sessions* later on this afternoon and there is also a more informal bereavement support available, so if you contact one of the organisers for people who want to avail of this, that will be available during the day.

I want to start off now by introducing to you Dr Paul Soloff, who is a Professor of Psychiatry at the Western Psychiatric Institute and Clinic in the University of Pittsburgh. He has been working with National Institute of Metal Health and engaged in *Longitudinal Studies of the Psychosocial and Biological Risk Factors for Suicidal Behaviour in Patients with Borderline Personality Disorder* and he tells me he has being doing this for about twenty years. He also tells me that while he worked as a researcher for about 75% of this time, 25% of this time his work is involved in working with people with enduring mental health problems. I'll introduce you to him now.

Prof Paul Soloff: Thank you and it is a privilege for me to be here and to present some of our work. First, I would like to acknowledge some of the many collaborators who have worked with me over the years on this research. The Irish contingent is very well represented and I am pleased that I had the privilege to work with Professor Kevin Malone when he was at the University of Pittsburgh. You've met Dr John Mann yesterday and I will elaborate that the Irish contingent is also well represented by Kevin Lynch formally of Dublin who was my statistician for several years and Thomas Kelly who still works me. The work that I am going to be presenting has been supported generously by the National Institute of Mental Health of the USA and by the American Foundation for Suicide Prevention.

We are going to be talking about risk factors today. It is important to study risk factors for suicidal behaviour from a variety of perspectives. Perhaps most importantly, from the perspective of families as well as professionals, is to try to identify areas that are predictive of suicidal behaviour, either suicide attempts or unfortunately completed suicides. Because by identifying the risk factors perhaps we can see where we can intervene, where we can find some areas that we can change and alter the course of events. So, I am going to go through a scientific review of what we know about risk factors in one particular entity called the *Borderline Personality Disorder* and would like you to keep in mind as you hear these many, many risk factors the overall thrust of the goal, to try to find areas were we can intervene.

Why do we study borderline personality disorder?

First of all, for those of you who are not clinicians, the borderline is perhaps the most severe of the personality disorders that is defined in Psychiatry. It is a syndrome defined by the characteristics you see on this screen. It is the only disorder in Psychiatric Nosology that is defined by recurrent suicidal behaviour. This is the only one for which recurrent suicidal behaviour is one of its diagnostic criteria. The other diagnostic criteria have to do with affective instability; they do with impulsiveness and with some of the psychological qualities that accompany those particular features. It has to do with the ways people feel about themselves; experiences of anger and emptiness; their vulnerabilities to develop distortions in thinking; their vulnerabilities to act on impulsiveness. But for purposes of our presentation today we are going to highlight the recurrent suicidal behaviour of the patient as the most important clinical feature and the two biological components of the borderline pattern, that is impulsivity and difficulties regulating affect as areas of vulnerability related to their suicidal behaviour.

How prevalent is the Borderline Diagnosis?

In the United States it is highly prevalent. Samples done of the general population indicate that:

- almost 2% of the general population can be diagnosed with this particular personality type, making it the most prevalent of the personality disorders.
- 15 – 20% of psychiatric in-patients in the USA can be diagnosed with borderline;
- 30 – 60 % of clinical patients with any personality disorders.

So it is a highly prevalent disorder.

Why is it important?

Because half of people who attempt suicide admitted to a hospital carry the borderline diagnosis, again these are USA studies.

Among borderline in-patients and these are my own data 72% have attempted suicide an average of three times by the time you see them for the first time, so these are people indeed who have recurrent suicidal behaviours. The bad news is that if you follow these folks for 15-27 years, and the odd numbers come from actual studies for 15 – 27 years, up to 10% have died by suicide.

There is good side to this of course, what happened the other 90%? When you follow some of these folks longitudinally, the vast majority do well, they do well in life but up to 10 % die in long-term follow ups of suicide.

One of our leading thinkers in this area Dr John Gunderson of Harvard has noted that the suicidal behaviour appears to be the behavioural speciality of the borderline patient. They respond with suicidal behaviour in response to stressors in life; they respond impulsively at times of rejection, at times of loss, but suicide seems to be their behavioural mode.

The Psychobiology of Suicidal Behaviour

I am going to be presenting data to you that comes from a prospective longitudinal study, *The Psychobiology of Suicidal Behaviour*. We look at the mediology of suicide as being multi-dimensional, ie. there are clinical elements; there are psychosocial elements and there are biological risk factors. We use a stress diathesis model. This is the model that Dr John Mann presented to you yesterday. The basic idea being that some individuals are more vulnerable than others to stresses in life. In the borderline case we are going to be talking about their impulsivity and their difficulties regulating their mood, which is called Affective Dysregulation, but their difficulties regulating their mood as being biologic elements that make these folks more vulnerable than other people to the stresses of life. The stresses of life can include depression, substance abuse, rejection in interpersonal relationships, the normal stresses that can occur to any of us, although in these folks with their special vulnerabilities, they often lead to suicide and suicidal behaviours.

So when anyone one does the study of risk factors in suicide they look at a whole list of common culprits. You start with demographic variables, diagnostic variables, personality traits. In the borderline case, we will be talking most about impulsivity and aggression, as they are prominent personality traits. You look at childhood and family histories; you look at the history of suicidal behaviours early in life; clinical symptoms at the time you see the patient and you look at social adjustments in the family, in school and in work; you look at their treatment history. Again I'll show you the list because all the literature in looking for risk factors has to at some point wrestle each of these factors. In addition in recent years we have looked at biologic factors. I have put on the screen some of the mechanisms that we use to investigate biology. I am not going to go into detail on each of them, but they involve most recently the use of modern pet scans and later on I

am going to show you a few pictures that come from this research to illustrate the use of this modern technology and understanding vulnerability to suicide.

Now, we are talking about risk factors but we have to have an understanding of the limitations of this kind of research before I launch into a long list of potential risk factors. First of all, suicidal behaviour is multi-determined. There are lots and lots and lots of causes. No one cause determines a suicidal outcome.

Risk factors increase the likelihood.

This is a statistical statement, and it increases the likelihood of a fatal event. It is not a certainty and as I said a few minutes ago no one risk factor will predict a suicidal outcome.

Now, when we do studies, studies can be done comparing people who have attempted suicide to people who do not attempt suicide for e.g. depressed people who attempt suicide compared to those who do not. We can look at completers; we can look at people who have gone on to complete suicide and by using the mechanisms of psychological autopsy, i.e. talking to the families, talking to the friends, we can get a picture of what was going on with those folks. We can look at completers and compare those to people who have just attempted suicide or people who just have suicidal ideas and have never attempted. So you can look at a variety of different conditions to try to define risk factors.

The bottom line is that the risk factors, which are found in people who are parasuicidal, i.e. people who attempt, are different than people who complete. There is an overlap, a big overlap, but there are some differences. In addition, risk factors for low and high lethality attempts differ. In my field for example, borderline patients are fond of hurting themselves. People who do superficial cutting of the wrists or burning themselves, which is all too common in young borderline patients, the risk factors for suicidal behaviour at that level of self-injury is different from people who do very high lethality overdoses or jump from bridges or use firearms. So risk factors differ for high and low lethality attempts.

Risk factors vary over time. If you study someone within one year of a suicide attempt and you catalogue the risk factors, they are very different than if you come back two or ten years later and look at the same person and catalogue their risk factors at that time. So risk factors change over time. They obviously change with the age of the person you are talking with.

Now, risk factors are not specific to any one disorder for e.g. hallucinations. Hallucinations may be a risk factor for suicide. They are very common in Schizophrenia. They are also occasionally found in depression or in people who use substances, hallucinogens for example. They may be a risk factor but they cut across diagnostic lines. So, it is important to know that risk factors are not limited to one particular disorder. It is more important because I am going to be talking about data derived from a single disorder with a borderline patient.

I am going to describe data from our ongoing study. At present we have 136 borderline patients in this study and I'll show the characteristics of the sample to illustrate the quality of the problems in this particular group. First of all, there is a preponderance of females in the United States who are labelled borderline. It is usually about $\frac{3}{4}$ of the borderline patients are female and $\frac{1}{4}$ are male. That is an American prejudice. In Europe, my colleagues in Europe have soundly criticised me and said Americans are fond of labelling the women with a psychiatric illness and calling the men anti-social. If you do exactly the same things, if you are a boy you go to jail in America and if you are girl you go to a mental hospital. That is an overview, obviously a simplification. The bottom line is statistically in the United States about $\frac{3}{4}$ of people with the borderline diagnosis are female, $\frac{1}{4}$ male. In Europe, it is more 50/50.

The age range of this sample is important. Their age range is about 28 yrs. Later on you will see in the statistics that the first lifetime suicide attempt in my population, the average is 19 yrs when they began with the first suicide attempts. So they have already been at it about ten years. Most of these folks, a little over the majority have never been married; most of our patients are middle to lower class, working class; about half of them were in-patients. Now, the sample I am going to describe, the vast majority are already suicide attempters, but we also took into our study who had not attempted, just people with borderline personality disorder who were contrasted with those who had gone on to attempt. As you can see, the number of attempters always overwhelms the number of non-attempters, that's a statistical problem that we have to wrestle with. So I will be describing data of 113 attempters versus 23 non-attempters.

We divided the sample into high lethality or low lethality. We use a scale called the Beck Lethality Scale to make that distinction. A score of four or more on the lethality scale means you have done something that is life threatening. To give you a specific example, most people in my sample attempt suicide by overdose. That is the most common form of suicidal behaviour in the United States. To get a score of 4 or more following an overdose you have to be comatose or admitted to a medical hospital for treatment of that overdose. So it is a pretty near lethal level, so those are our highly lethality folks.

Again it is important to know that our group resembles other personality disorders, other borderline samples. About half have co-morbid depression, major depression; over half have a diagnosis of substance use; adverse childhood experiences we will go into more detail later, but borderline personality disorders associated with childhood difficulties, most prominently a history of childhood abuse and I am going to go into in more detail later. The age of first attempt, a little over 19 years of age, again our patients are 28 yrs on an average when we see them in the study.

What I am going to do now is review for you the risk factors for suicidal behaviour in borderline personality disorder. We are going to go class by class and identify them. I have taken the liberty of marking with an asterisk those risk factors which have been shown statistically significant in separating attempters from non-attempters in my ongoing study. Later on we will talk about high lethality, low lethality but I am going to show you a general review of the literature. So these risk factors include factors which have discriminated attempters from non-attempters and in some studies completers from non-completers. So that it is a pretty broad review of the literature. In some of these areas, obviously we can intervene, some of these areas we cannot but again for the families and friends, I want you to look at this list and kind of think about what areas would be useful to do intervention early on.

Borderline Personality Disorder: Lethality Risk Factors:

- Older Age
- Lower social economic status
- Having Children
- Religion non-protective
- No relationship gender, race, marital status

First of all in the borderline personality disorder, older age is more predictive of suicidal outcome of death actually. Dr Paris of Montreal identified a group of suicide completers after 27 years of follow up. The average age at death was 37 years. Remember that my sample is 28 years, so we still a few years to go.

These are predominately lower social economic status. Less education, less employment, lower income are common findings among suicide completers with borderline personality disorder.

We found that responsibility for children was not protective. Many studies in depression find that if you have kids, you are less likely to commit suicide. In our particular study, responsibility for children was not only not protective, but having children was associated with suicide attempt.

Religion was not protective in borderline personality disorder and in this particular personality style there is no relationship to gender, race or marital status.

Diagnostic Variables

Again no surprises here. Again, the borderline is a useful model for studying suicidal behaviour in general so that we are going to be finding some of the same variables:

- Co-morbid Depression
- Alcohol and Substance Abuse
- Antisocial Behaviour
- Personality Traits/Impulsivity
- Emotional Instability
- Childhood & family history
- Childhood Sexual Abuse
- Patients Suicide History
- Intent to Die
- Reasons for Living
- Method
- History of Self-Harm

- **Co-morbid Depression:** Depression is a major, major contributor to suicidal behaviour in all studies;
- **Alcohol and Substance Abuse**
- **Anti-social Behaviour** - I am going to come back to the antisocial behaviour because it turns out to be very important.
- **Personality Traits / Impulsivity:** you heard yesterday Dr Mann talk about impulsivity as a personality dimension which represents, we believe, a temperamental vulnerability to suicidal behaviour. In other words, regardless of what is going on in your life, if you happen to be an impulsive person by temperament you are more likely to act against yourself, you are more likely to do something impulsive that is self-injurious. Borderline patients are defined in part by impulsivities, that why we study them. So impulsivity is a major cause of their suicidal behaviour but if you look at a whole group of borderline patients and you compare within the group, they are all impulsive, so impulsivity does not stand out within the group. If you compare borderlines to other groups, then the impulsivity stands out as a major factor.
- **The Emotional Instability:** I mentioned, anti-social traits again as a personality feature which comes up again, again and again. In European studies they look at actual consequences eg. sentence by court, the actually coming to judicial review and being sentenced by court was associated with fatal outcome in personality disorders.
- **Childhood and Family History:** Again, this is part of the work of the Suicide Centre to look at childhood and family histories. Dr John Mann, as principal investigator of the Suicide Centre both in Pittsburgh and now in New York, was responsible for developing forms to assess early life events e.g. separation from a parent before age fifteen years and we looked at six month separation, six months being considered a reasonably long time from a parent before the age of fifteen years. That single event distinguishes people who are attempters from non-attempters, statistically significantly.
- **A History of Childhood Sexual Abuse:** I'll come back to again. It is very important in this area and does distinguish attempters from non-attempters.
- **A Family History of Substance Abuse:** not just the patient but the family history ie. people drinking, people doing drugs in the family around the patient and a family history of suicide is very important.
- **The Patient's own Suicide History:** Now, as I mention that we get these folks in hospital or when we see them for the first time, they have already attempted an average of three times. Not all of those attempts have come to professional attention. A lot attempts, especially in teen years, are unreported and you sit down with a patient and you find out yes they took an overdose, they went to sleep and they woke up a day later or something and didn't tell mother. Nobody knew, or they tried to drown themselves with alcohol, they knew if they drank enough they could become toxic, nobody knew. So when you actually list the number of attempts, we find that our patients have an average of three attempts by the time we begin talking to them. The number of prior attempts is the strongest predictor in many studies of a future attempt and of completion. There is an old myth in psychiatry and in medicine in general that you didn't talk people about their suicide attempts. The idea was that if talked them about it, it would somehow encourage future attempts. When I trained actually, I trained as a psychiatrist, we had to combat that view in our medical colleagues. They did not want to talk about suicide because they were afraid if you stirred things up there might be further events. The opposite is true, but we do know that a history of previous attempts is the best predictor of future attempts and completion, so never to be taken lightly.
- **Intent to Die:** How severely is the person committed to dying in their attempt? There is variety, a spectrum when you talk to someone of what they had in mind. As the speaker said yesterday, you get a whole variety of reasons why they did what they did but the more that those reasons had to do with dying, with actual death/finality, the more likely it is for them to be future attempters and completers.
- **Reasons for Living:** If they have few reasons for living they are more likely to attempt suicide. Dr Kevin Malone has shown this in depressed patients. This is a simple scale. It is actually a form that Marshal Linehan worked out where you can actually go through and talk to the patient of the reasons for living. The actual patient fills it out. Folks who go on attempt suicide have very few reasons for living. Again these are questions of physicians often don't ask.

- **The Violence of the Method:** In depression studies and some of our own studies as patients begin to re-attempt and re-attempt, they tend to use more and more violent methods until finally there is a fatal outcome.
- **Self-Harm:** Or a history of non-suicidal self-injury. Borderline patients often have an early history of cutting, burning, writing on themselves, or carving in their skins. This superficial self-injury is indicative of serious psychopathology in many, not all but in many of these folks (mostly young girls), but it is a very strong predictor of suicide attempts.

Traits: When we first see the person, as I said half of our sample is seen in hospital but half are not. Many of the people are seen in the outpatient clinic. Actually in my research, many of them have dropped out of treatment or in-between episodes. When we measure their amount of depression and then we look at how predictive it is, we find that their depressed mood measured by scales like the Hamilton or the Beck rating scales as a research method, are predictive of whether they had attempted suicide or not in the past. In general, the severity of depressed mood tends not to distinguish whether you are a completer or not a completer. That's an interesting finding that's been found in a lot of studies.

.It is not how severe your depression is in the long run.

Hopelessness: is important, now the Beck Hopelessness scale is just sort of a fancy way of finding out whether you have any reasons for living, how serious you are about dying. Hopelessness is a quality of depression in some folks, not all. Hopelessness tends to recur with each episode. It is not something that the person has all the time. When you have an episode of major depression, if you are one of these folks who has hopelessness, it tends to appear as a trait. So hopelessness, although it appears at times of major depression, reappears with each episode of depression and may not be there in between. It is a trait and so it has predictive value and it is been shown by Dr Beck and others that hopelessness actually predicts suicidal outcomes.

Social Adjustment: Patients who attempt suicide, when we reviews of their families, they have very poor social adjustment. Families don't get along; there is a lot of conflict in the family; there has been a lot turmoil; they have a lot of, what we call recent life chances which can be good or bad but in general negative but a lot of life events, a lot of changes especially in interpersonal relations. These are very fancy ways of saying what is common sense. People who have upsets; people who have break-ups of relationships; those of you saw the film yesterday, saw a grieving mother talk about the break-up in relationships, her son who broke up with a girlfriend and that seemed to be the last straw that precipitated a suicide. So break-ups in interpersonal relationships are perceived rejections. These are very common in the weeks to months prior to a fatal event. Social isolation; avoidance of intimacy; problems with employment; finances - these are all common social adjustment difficulties of people who attempt suicide.

By the time we see them for the first time, they have long histories. In my particular study they have had many previous hospitalisations, numbers of hospital admissions. They have been in and out of psychotherapy. One of the interesting finding among people who actually complete suicide in a European study looking at personality disorders, they found that in the three months prior to a suicide completion in personality disorder patients, there had been no treatment and these folks had kind of dropped out. They dropped out of the system and they had no health contacts. I'll come back to that point in a minute.

Now, this is a summary of what we have been talking about: attempters versus non-attempters; the significant predictors of attempt in borderline patients. Again, all of the usual suspects are here: elements of depression; early self injury; childhood histories of abuse; difficulties in the family; separations; fewer reasons for living; poor social adjustments and lots of treatment.

High Lethality Attempters: I have given you lists of attempters and non-attempters. How about those who are high lethality attempters? Let us look at that 136 people and go down to those 113 who actually attempted and divide them into high lethality, low lethality predictors. The high lethality, folks remember if they took an overdose, they ended up in a coma or ended up being admitted to a medical hospital - pretty serious events. The number of predictors gets smaller and smaller. These folks tend to be: older; they tend to have children (remember children are not protective in personality disorder); less education; lower social economic status; they have more depression; more co-morbid anti-sociality; a family history of substance use; greater intent to die and more hospitalisations.

If we look at which of these characteristics is most important: low social economic status or anti-social behaviour. With anti-social behaviour an odds ratio of 3.66 means you are over three fold more likely to attempt high lethality suicide if you have the anti-social traits, lots of treatment and suicidal intent.

Impulsivity / Serotonin Brain Research: Now I am going to zoom ahead a little bit because were getting short on time. I wanted to show you some of the important modern information. I have been highlighting impulsivity as a major risk factor for suicidal behaviour. Again forgive me for zooming ahead for the purpose of saving time. Impulsivity is significantly as a major risk factor for suicide attempts with a lifetime number of suicide attempts. It has a biologic basis. Impulsivity is a temperament and it is biologically tied to the serotonin system in a part of your brain. Again forgive me for moving ahead but I want to get to some of the more interesting findings.

What we find in the brain when we look at people who are highly impulsive is decreased metabolism, a lower level of functioning than is normal in one particular area of the brain, i.e. the area of the brain that regulates the release of affect in mood, affect in impulse. The part of the brain in front that acts like a traffic cop and it says what shall go forth and what shall stop. It is a major inhibitor of impulsive behaviour. We did imagining of these folks looking at the pre-frontal area predominately in non-depressed, medication free, non-substance using borderline patients. These are clean as we could find them and this is what we found.

You look at these areas in prefrontal cortex. What you are looking at are thirteen female borderline patients and nine female controls. The images are obtained on a pet scan. A pet scan measures the amount of radiation coming from sugar water, from a fluoridated glucose that we inject. The radioactive glucose goes to the brain. The part of the brain that is working the hardest gets the sugar and we pick it up with a fancy scanner. If you compare the brains of normal people to the brains of non-depressed female borderline patients and then you colour the area that has lower activity and colour it yellow in this particular case, we find an area of diminished activity, lower activity than normal in that very area of the brain, orbital area the prefrontal cortex which is responsible for inhibition. This is biologic proof that something is wrong in non-depressed borderline patients. These are highly impulsive ladies, something is wrong.

What happens if we give there folks a serotonin agonist, a drug that enhances the release of serotonin in the brain? We use phenfloramine, (again this is pioneered by Dr John Mann who spoke yesterday and Kevin Malone has done a lot of this work). I want you take a look at normal people. This is the brain of normal controls, control people on phenfloramine. What you are looking at is an increase in activity in this particular scan, a big burst of activity, an uptake of glucose, that is normal. This is, I hate to put it this way here, on the American commercial "this is your brain on drugs", this is what happens in normal people who take a serotonin enhancing drug. It activates the serotonin system. Now the serotonin system is the inhibitory system, it is what stops impulses. This is what happens in borderline patients, nothing. Now again, I am exaggerating but nil response compared to a brisk response. So something is wrong in the serotonin responsiveness of borderline patients. It is a bio-chemical problem in the area of the brain that regulates impulsiveness.

Social Adjustment Study

I want to go to some of the good news now. The good news comes out the Social Adjustment Study. I mentioned social adjustment. I mentioned how bad the social adjustment was in borderline patients who go on to attempt suicide. What we found is that these folks, attempters and high lethality attempters, have lower social adjustment than people who do not attempt suicide. Why is that important? Well, people who attempt suicide or are sick with borderline pattern are sixteen times more likely to be classed as attempters. Increased social adjustment on the other hand, if you play with the statistics it goes the other way too. Better social adjustment is associated with a decrease probability of attempter classification. Social support turns out to be a major protective factor. Again what we have shown is common sense. The tighter the family, the more social support the more protection against a suicidal event. It doesn't mean it is not going to happen, but it is just more factor, something you can do. It is a protective factor and perhaps it is an area for intervention.

Thank you very much for your attention.

Teresa Mason: Now I want to thank Professor Soloff for that really interesting presentation. It is very useful to hear about work of that quality with borderline patients, a group that are very neglected by our own system in Ireland. It is a challenge that we have to take up, I think, to find better ways of working with people with this diagnosis. Thank you Professor Soloff.

