

# The duty of therapists to third parties

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To Professor SA Strauss I want to express heartfelt thanks for his collegiality and for his scholarship. I met Sas (as he is affectionately known) in the mid-1970s in South Africa and thereafter on a number of trips I had the pleasure of his company. I have fond memory of our encounters.

Sas has given generously of his time. He is remembered for his service on the board of governors of the World Association for Medical Law and for his editorship of the international journal *Medicine and Law*.

Through the years I have valued his scholarship in medical law. His writings are remarkable in their number and quality. His scholarship is admired worldwide.

Sas is renowned for his integrity, dignity, dependability, and courage. He has been an inspiration.

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When do therapists owe a duty to persons other than their patients? The threshold question in a negligence action is whether the defendant owed the plaintiff a legal duty. As a general principle, the risk that may result from one's behaviour, as reasonably perceived, determines the duty of care as well as to whom the duty is owed.

It is an axiom that good medical care involves consideration not only of the patient but also of others. The duty to others finds expression in legislation imposing various reporting obligations on physicians. However, in determining to whom a duty of care is owed, the courts are mindful of the extent of liability insurance coverage.<sup>1</sup> The courts not only consider the foreseeability of harm but they also assess the competing public policy considerations for or against imposing a duty. As one court expressed it, 'Liability must be controlled by workable and just limits.'<sup>2</sup> In the event that the court deter-

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<sup>1</sup>*Ryan v New York Central RR Co* 35 NY 210 91 Am Dec 49 (1866); AE Smith 'The miscegenetic union of liability insurance and the tort process in the personal injury claims system' 1969 *Cornell L Rev* 645; EJ Weinreb 'Causation and wrongdoing' 1987 *Chi-Kent L Rev* 407.

<sup>2</sup>*Stadler v Cross*, 295 NW 2d 552 (Minn 1980); quoted in *Iacona v Schrupp* 521 NW 2d 70 (Minn App 1994).

mines that no duty exists, summary disposition — that is, judgment without the necessity of going to trial — is the appropriate remedy.

The issue of duty was highlighted in the most discussed of all torts cases, *Palsgraf v Long Island RR Co*.<sup>3</sup> A passenger, rushing to catch the defendant's train, was pushed by a train porter as he was about to board and a package was dislodged from his grasp. It fell upon the rails. It contained fireworks, it exploded, and the concussion overturned a weight scale, a distance away on the platform, injuring Mrs Palsgraf, the plaintiff. Judge Cardozo, for the majority, held that there was no liability because there was no negligence toward the plaintiff. Negligence, he said, must be founded upon the foreseeability of harm to the person in fact injured. The defendant's conduct was not a wrong toward the plaintiff merely because there was negligence toward someone else. The plaintiff, Judge Cardozo said, must 'sue in her own right for a wrong personal to her, and not as the vicarious beneficiary of a breach of duty to another.' The law on negligence does not include a concept of 'transfer of negligence' from one party to another. The train porter's behaviour was reasonably foreseeable to cause injury to the passenger but not to Mrs Palsgraf standing a distance away on the platform.

As a matter of law, can therapy or care of a patient result in a foreseeable risk of harm to a third person? The answer is a problematical yes. One result of mal-psychotherapy may be a patient's acting out in an unlawful manner. Clearly, to take an extreme example, a therapist who hypnotizes a patient and suggests the commission of a crime is a wrongdoer.<sup>4</sup>

Mental hospitals are obliged to exercise reasonable care in preventing escapes or approving releases; they have a duty to protect third parties. In numerous cases, hospitals or staff members have been held liable for breach of this duty.<sup>5</sup> In the absence of charitable or governmental immunity, the courts have placed on mental hospitals a duty owing to the general public to exercise reasonable care in escape prevention and release decisions. For the most part, the courts in these cases have not distinguished between foreseeable and unforeseeable victims. The cases mostly involved rather obvious diagnostic, administrative or communication errors.<sup>6</sup>

<sup>3</sup>248 NY 339, 162 NE 99 (1928).

<sup>4</sup>Under the influence of Jim Jones, members of the People's Temple in Jonestown murdered Congressman Leo J Ryan and then committed suicide en masse. *United States v Layton* 549 F 2d 903 (ND Cal 1982).

<sup>5</sup>Thus, a New York court said that a state mental hospital 'has a duty to protect the community from acts of insane persons under its care.' In this case, the hospital breached its duty of care by failing to provide adequate security in view of the patient's known violent tendencies. *Jones v State of New York* 267 App Div 254, 45 NYS 2d 404 (1943).

<sup>6</sup>To take an illustration, a complaint that a hospital doctor, after an allegedly superficial psychiatric examination, released a patient without warning to a foreseeable victim, despite knowledge of the patient's previous threats against that victim, made out a negligence cause of action. Hospital treatment of mental patients, the court said, induces the public to rely on and to expect an exercise of reasonable care. The

Policy lines, to some extent arbitrary, are drawn to narrow the scope of duty or actionable causation.<sup>7</sup> A number of states do not allow anyone but the patient to sue over negligent treatment even when that malpractice causes physical injury to others, as occurs when an infectious disease is improperly treated and is passed on to family members. In Illinois, in a case of this sort, the defendant physician raised the spectre of a potentially unlimited liability to all those infected by his patient as well as all those whom they infect, and he also asserted that allowing the patient's immediate family to sue would constitute an artificial distinction between family members and all others whom his patient or they might infect. The majority of an intermediate appellate court agreed.<sup>8</sup> Justice Freedman, dissenting, would have extended the duty to the patient's immediate family. He said, 'I cannot agree that limiting the right to sue ... to a patient's immediate family members, ie, to those with whom he has special relationships, is an artificial and arbitrary distinction'.<sup>9</sup>

In this type of situation, other states have not limited a cause of action only to patients. In a case decided by the Pennsylvania Supreme Court,<sup>10</sup> a physician negligently advised a patient exposed to hepatitis that if she remained symptom free for six weeks she had not contracted the disease and was not contagious. The advice should have been six months rather than six weeks. The patient refrained from sexual intercourse for eight weeks after the exposure and then resumed sexual intercourse with the plaintiff. Both patient and plaintiff were diagnosed with hepatitis. The court held that the plaintiff had a cause of action against the physician.<sup>11</sup>

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'obligation of due care extends to the public', said the court. *Fair v United States*, 234 F 2d 288, at 294 (5th Cir 1956). See also *Merchants National Bank & Trust Co of Fargo v United States* 272 F Supp 409 (DND 1967); *Homere v State* 79 Misc 2d 972, 361 NYS 2d 820 (1974).

<sup>7</sup>See *Renslow v Mennonite Hosp* 67 Ill 2d 348, 10 Ill Dec 484, 367 NE 2d 1250 (1977).

<sup>8</sup>*Britton v Soltes* 205 Ill App 3d 943, 150 Ill Dec 783, 563 NE 2d 910 (1990).

<sup>9</sup>Justice Charles Freeman dissenting, 563 NE 2d at 916.

<sup>10</sup>*DiMarco v Lynch Homes* 525 Pa 558, 583 A 2d 422 (1990).

<sup>11</sup>The court said (583 A 2d at 424-425): 'Physicians are the first line of defense against the spread of communicable diseases, because physicians know what measures must be taken to prevent the infection of others. The patient must be advised to take certain sanitary measures, or to remain quarantined for a period of time, or to practise sexual abstinence of what is commonly referred to as "safe sex". Such precautions are taken not to protect the health of the patient, whose well being has already been compromised, rather such precautions are taken to safeguard the health of others. Thus, the duty of a physician in such circumstances extends to those "within the foreseeable orbit of risk of harm". If a third person is in that class of persons whose health is likely to be threatened by the patient, and if erroneous advice is given to that patient to the ultimate detriment of the third person, the third person has a cause of action against the physician, because the physician should recognize that the services rendered to the patient are necessary for the protection of the third person ... We further hold that the class of persons whose health is likely to be threatened by the patient includes any one who is physically intimate with the patient. Those, like the trial court, who insist that we cannot predict, or foresee, that a patient will engage in sexual activity outside of the marital relationship and that thus, we need not protect those who engage in "casual" sex, are exalting an unheeded morality over reality.' (Emphasis by court.)

In various jurisdictions the courts have held a physician liable to members of a patient's family who contracted tuberculosis as a result of negligent failure of the physician to warn of danger of contagion.<sup>12</sup> A physician's liability has also been held to run to unidentifiable third persons in cases where the physician he failed to warn the patient not to drive because of an uncontrollable diabetic condition.<sup>13</sup> In products litigation, liability has been extended at times to foreseeable victims of a defective product.<sup>14</sup>

In a 1980 California case, *Molien v Kaiser Foundation Hospital*,<sup>15</sup> a physician incorrectly and negligently informed a patient that she had an infectious type of syphilis, and she was advised to tell her husband. The misdiagnosis allegedly caused her to become 'upset and suspicious that [her husband] had engaged in extra-marital sexual activities; tension and hostility arose between the two, causing a break-up of their marriage and the initiation of dissolution proceedings.' The husband sued the hospital and the diagnosing physician for the infliction of emotional distress he suffered and for loss of consortium. The California Supreme Court held that the complaint stated a cause of action because the husband was a 'direct victim' of the physician's alleged negligent act.<sup>16</sup>

<sup>12</sup>See *eg Hoffman v Blackmon* 241 So 2d 752 (Fla App 1970); *Skillings v Allen* 173 NW 663 (Minn 1919).

<sup>13</sup>See *eg Myers v Quesenberry* 193 Cal Rptr 733 (Cal App 1983).

<sup>14</sup>WH Hardie 'Confronting Foreseeability in Products Litigation', *For the Defense* Oct 1994 4. In *Enright v Eli Lilly* 77 NY 2d 377, 570 NE 2d 198, 568 NYS 2d 550 (1991), the New York Court of Appeals held that a brain-damaged girl had no legal standing to sue the manufacturer of the drug DES (diethylstilbestrol), which her grandmother took during pregnancy. The suit claimed that DES taken by the grandmother caused the plaintiff's mother to be born with a malformed uterus, which in turn caused her premature birth and resulting cerebral palsy. In a 5-1 decision, the court ruled that the third generation had no right to sue because there was no 'contact with the substance' and liability should be limited to 'those who ingested the drug or were exposed to it in utero.' The court said, 'For all we know, the rippling effects of DES exposure may extend for generations. It is our duty to confine liability within manageable limits. Limiting liability to those who ingested the drug or were exposed to it in utero serves this purpose.' The concept of 'proximate' or 'legal cause' is another way that courts limit liability. As a matter of public policy, the court may find there is no 'proximate cause' between the harm claimed by the plaintiff and the defendant's negligence. In such an instance, the damages are called 'remote.' 'It is not easy at all times to determine what are proximate and what are remote damages.' *Ryan v New York Central RR Co* 35 NY 210, 91 Am Dec 49 (1866). Usually, foreseeability is considered an element of negligence, not cause. Unlike the question of duty, the proximate cause issue is more within the province of the jury. *Stewart v Wulf* 271 NW 2d 79 (Wis 1978).

<sup>15</sup>27 Cal 3d 916, 616 P 2d 813, 167 Cal Rptr 831 (1980).

<sup>16</sup>The court said (27 Cal 3d at 923, 167 Cal Rptr at 835): 'The risk of harm to plaintiff was reasonably foreseeable to defendants. It is easily predictable that an erroneous diagnosis of syphilis and its probable source would produce marital discord and resultant emotional distress to a married patient's spouse; [the doctor's] advice to Mrs Molien to have her husband examined for the disease confirms that plaintiff was a foreseeable victim of the negligent diagnosis. Because the disease is normally transmitted only by sexual relations, it is rational to anticipate that both husband and wife would experience anxiety, suspicion, and hostility when confronted with what they had every reason to believe was reliable medical evidence of a particularly

At trial, of course, the alleged facts would have to be established by a preponderance of the evidence. Proving fault may not be as difficult as proving that the alleged harm is the result of the fault. Causation, unlike duty, is usually a jury determination.

### **Tarasoff/Duty to warn or protect in the outpatient setting**

Social changes have increased the likelihood that therapists will care for potentially dangerous patients who are not under custodial control. No decision caused more concern in the psychiatric community than the decision by the California Supreme Court in *Tarasoff v Regents of the University of California*.<sup>17</sup> Among psychiatrists, the name of the case has become a household word. The decision, though it arose in the mid-1970s, continues to be discussed at psychiatric meetings and in countless publications.<sup>18</sup>

In this case, Prosenjit Poddar, a 25-year-old graduate student from India at the University of California, had met weekly for a total of eight sessions with Dr Lawrence Moore, a clinical psychologist at the outpatient department of the university hospital. He revealed thoughts of harming, even killing, a young woman, readily identifiable as Tatiana Tarasoff, who had rejected him. Dr Moore, with the concurrence of a colleague, concluded that Poddar should be committed for observation under a 72-hour emergency psychiatric detention provision of the California commitment law. He notified the campus police that Poddar was dangerous and should be committed. The campus police questioned Poddar and they also talked to other people familiar with him. They warned him to stay away from the girl. They concluded that commitment was not necessary. Poddar never returned to the clinic, perhaps because he felt his trust in Dr Moore had been betrayed. Two months later, when Tatiana returned from vacation he stabbed her to death.

In *Tarasoff*, as is well known, the California Supreme Court imposed a duty on psychiatrists or other psychotherapists to protect readily identifiable third parties from potential harm by their patients. In so doing, the court made the psychiatrist a proper party defendant whenever a patient causes injury.<sup>19</sup> In jurisdictions following *Tarasoff*, it no longer is possible for therapists to get

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noxious infidelity. We thus agree with plaintiff that the alleged tortious conduct of defendant was directed to him as well as to his wife. Because the risk of harm to him was reasonably foreseeable we hold, in negligence parlance, that under these circumstances defendants owed a plaintiff a duty to exercise due care in diagnosing the physical condition of his wife.'

<sup>17</sup>The case was actually heard twice. *Tarasoff I* 118 Cal Rptr 129, 529 P 2d 553 (1974), vacated *Tarasoff II* 17 Cal 3d 425, 131 Cal Rptr 14, 551 P 2d 334 (1976).

<sup>18</sup>D Truscott 'The psychotherapists's duty to protect: an annotated bibliography' 1993 *J Psychiatry & Law* 221.

<sup>19</sup>In this case the trial court had sustained a demurrer to the complaint. A demurrer declares that even if everything stated in the complaint were true, it does not state facts sufficient to constitute a cause of action. It is, in effect, a legal shrugging of the shoulder: 'So what?' In modern procedure a 'motion to dismiss' or summary judgment replaces the demurrer, and if denied the case simply proceeds to trial on the merits.

out of the case by summary disposition on the ground that they owe no duty in law to the injured party. Under *Tarasoff*, it is now a matter for the jury to decide on the basis of the facts of the particular case whether the third party was readily identifiable and reasonable care was exercised.

The case was settled but had it gone to trial, the court could have found that the therapist in fact discharged the duty imposed by the court, since he had notified the campus police.

The importance of the case, though it was settled, is that it imposed a legal duty on therapists to readily identifiable third persons irrespective of the standard of care in treating the patient.<sup>20</sup>

However, one might ask whether the therapy was below standard of care. The case might have been litigated, purely and simply, as one of mal-psychotherapy, like mal-chemotherapy, resulting in the patient harming others. One colleague at the clinic suggested that Dr Moore was not sufficiently experienced or otherwise able to handle the case. Not long before, events in Dr Moore's life — a suicide attempt by his wife and her attempted murder of their child — had traumatized him. Following the death of Tatiana, he was dismissed from the clinic.

The case could have been litigated and decided on the basis of negligent treatment rather than on the formulation of a special duty or relationship to third persons. A 'special relationship' to a third party need not be found in cases where the treatment of the patient is negligent and results in 'direct injury' to the third person. The negligent-treatment approach apparently was not taken because of the difficulty in establishing standard of care in psychotherapy.

The California Supreme Court during the 1970s was a 'progressive court' that expanded theories of law in this case and others, and was followed in a number of other jurisdictions. The court held that by virtue of the 'special relationship' that a therapist has with a patient, there results a duty of care to third parties who might be injured by the patient. It is immaterial whether or not the treatment of the patient falls below standard of care, or whether or not there is a causal nexus between the treatment and the injury to the third person. The court said:

Although under the common law, as a general rule, one person owed no duty to control the conduct of another, nor to warn those endangered by such conduct, the courts have carved out an exception to this rule in cases in which the defendant stands in some special relationship to either the person whose conduct needs to be controlled or in a relationship to the foreseeable victim of that conduct.

The court went on to say that the special relationship with the patient also

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<sup>20</sup>When a case may go to a jury, given the uncertainty of their verdict, insurers and others tend to settle.

creates a special relationship with a victim of the patient.<sup>21</sup> Under the *Tarasoff* innovation, a special relation between A and B creates a special relation between A and C. Thus, A is liable for the injury B causes to C even though A is not directly negligent toward C. The *Tarasoff* decision and its progeny represents an evolution of the law from no duty, to a duty to those in a special relation, and now to those who might be harmed by one to whom a duty is owed. The court said:

Although plaintiff's pleadings assert no special relation between Tatiana and defendant therapists, they establish as between Poddar and defendant therapists the special relation that arises between a patient and his doctor or psychotherapist. Such a relationship may support affirmative duties for the benefit of third persons. Thus, for example, a hospital must exercise reasonable care to control the behavior of a patient which may endanger other persons. A doctor must also warn a patient if the patient's condition or medication renders certain conduct, such as driving a car, dangerous to others.

Although the California decisions that recognize this duty have involved cases in which the defendant stood in a special relationship both to the victim and to the person whose conduct created the danger, we do not think that the duty should logically be constricted to such situations (emphasis by court). Decisions of other jurisdictions hold that the single relationship of a doctor to his patient is sufficient to support the duty to exercise reasonable care to protect others against dangers emanating from the patient's illness. The courts hold that a doctor is liable to persons infected by his patient if he negligently fails to diagnose a contagious disease or, having diagnosed the illness, fails to warn members of the patient's family.

Under this ruling, a third party victim may bring a claim against a therapist regardless of whether or not the therapist's care and treatment of the patient constituted malpractice. Indeed, it could have been the best of therapy. One might imagine a situation where an individual comes to a therapist and confides a plan to harm a third party but departs immediately thus depriving the therapist of any therapeutic opportunity. The *Tarasoff* ruling would require the therapist to protect the potential third party victim. Under *Tarasoff*, the focus of concern is the foreseeable risk to a third party.<sup>22</sup>

The court in *Tarasoff* rationalized its holding in part by citing earlier decisions holding physicians liable for failing to warn third parties who contracted contagious diseases from their patients.<sup>23</sup> What care to protect potential victims

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<sup>21</sup>The common law did not impose an obligation to aid or protect another, even if the other is in danger of losing his life. In a classic example, an accomplished swimmer with a boat and rope at hand, who sees another drowning, but did not put him in that peril, is not required to do anything at all about it. The common law imposed a duty on a person to render aid only when that person created the peril or when there is a special relation between the parties. For example, because of a special relation, a carrier is required to take reasonable affirmative steps to aid a passenger in peril, an innkeeper to aid a guest, or a physician to aid a patient. Unless there is a special relation between the parties, a duty arises only by virtue of misfeasance that is foreseeable will cause injury to the plaintiff. *Osterlind v Hill* 263 Mass 73, 160 NE 301 (1928).

<sup>22</sup>PC Cartensen 'The evolving duty of mental health professionals to third parties: a doctrinal and institutional examination' 1994 *Int'l J Law & Psychiatry* 1.

<sup>23</sup>551 P 2d at 354.

is reasonably necessary, the court said, can be determined only on a case-by-case basis.<sup>24</sup>

### Ramona/'Revival of memory'

In a growing area of concern, the question that now arises is whether family members who are hurt by 'recovered memory' therapists have a right of redress in the legal setting. Clearly the patient has a basis for a malpractice action against the therapist; a number of patients who have recanted memories of sexual abuse have reunited with their families and then brought suit against the therapist for malpractice.<sup>25</sup> But what about a claim against a therapist by one other than the patient?

Conceivably, parents may proceed on a theory as in *Molien* that the parents are 'direct victims' of the therapist's negligence, or on a theory as in *Tarasoff* that the 'special relationship' with the patient creates a 'special relationship' with a person who is harmed by the patient. The *Molien* approach is less novel, jurisprudentially speaking, than the *Tarasoff* approach.

With increasing frequency individuals in the course of therapy 'recover' repressed memories of childhood sexual abuse. The memory of abuse supposedly is 'repressed' until, usually with the help of a therapist, it is remembered. Treatment programs use a variety of techniques to help patients recover the memory. The book, *The Courage to Heal* has been influential. It contains statements such as: 'If you are unable to remember any specific instances ... but still have a feeling that something abusive happened to you, it probably did.' 'If you think you were abused and your life shows the symptoms, then you were.' Revenge, anger, and deathbed confrontations are encouraged. The book advises, 'You are not responsible for proving that you were abused.'<sup>26</sup> Treatment centres advertise, 'Remembering incest and childhood abuse is the first step to healing'.

What may be helpful therapeutically as a narrative is used as historical, fact-based truth. Patients, convinced that they were abused, are furious at their parents and blame them for their troubles. They take such actions as suing the parents, refusing to let them see their grandchildren, or ruining their reputations by informing friends and acquaintances about the newly

<sup>24</sup>To safeguard themselves and to make sure of their legal duty, psychiatrists in various states have lobbied for legislation to provide that issuance of a warning alone discharges their duty. R Slovenko 'The Tarasoff progeny' in RI Simon (ed) *Review of Clinical Psychiatry and the Law* (Washington, DC: American Psychiatric Press, 1990), vol 1 ch 8 177.

<sup>25</sup>*Joyce-Couch v DeSilva* 77 Ohio App 3d 278, 602 NE 2d 286 (1991); see B Marvel 'Past memories present tense' *Dallas Morning News* 10 July 1994, F-1; 'Furor rises over lost memories; more suits expected against therapists' *Dallas Morning News* 10 July 1994 A-1.

<sup>26</sup>E Bass & L Davis *Courage to heal* (New York: Harper & Row, 1988).

discovered memories.<sup>27</sup> Some 700 civil and criminal cases have been filed based on retrieved memories of childhood abuse.<sup>28</sup> In these cases of 'revival of memory' there apparently has been no objective or corroborating evidence of abuse.

A few decades ago the *Zeitgeist* was to blame victims. A woman who was raped was 'asking for it' by walking alone at night or for wearing a short skirt. Today the *Zeitgeist* is a claim of victimhood whatever the reality. The 'victims' are angry and they want to wreak vengeance on those whom they believe have abused them. The legal system (both civil and criminal tracks) provides a ready and willing vehicle for gratifying this morbid desire.<sup>29</sup> Russell Baker of the *New York Times* observed recently that 'anger has become the national habit.'<sup>30</sup> In his book *Culture of Complaint*, Robert Hughes writes, 'The ether is now jammed with confessional shows in which a parade of citizens and their role-models, from Latoya Jackson to Roseanne Barr, rise to denounce the sins of their parents, real or imagined.'<sup>31</sup>

In many cases, the false memory and resulting false accusations of incest and sexual abuse hurt the patient's family. Whatever estrangement had existed in the family is exacerbated. The False Memory Syndrome Foundation, founded in 1992 Philadelphia to aid the victims of what is called false memory syndrome, reports over 13 000 requests for help or advice.<sup>32</sup>

The backlash has been widely reported: National news weeklies *Time* and *Newsweek* in November 1993 both had cover stories on hidden memories.<sup>33</sup> *Time* wrote, 'Repressed-memory therapy is harming patients, devastating families, and intensifying a backlash against mental-health professionals.' Earlier that year, in May, *Insight*, another national newsweekly, had a cover story, 'Malignant Memories: Therapists as Coaches.'<sup>34</sup> Also, in May, the *New*

<sup>27</sup>R Slovenko 'The "revival of memory" of childhood sexual abuse: is the tolling of the Statute of Limitations justified?' 1933 *J Psychiatry & Law* 7; H Wakefield & R Underwager 'Recovered memories of alleged sexual abuse: lawsuits against parents' *Behavioral Sciences & Law* 10: 483, 1992.

<sup>28</sup>S Begley 'You must remember this' *Newsweek* 26 Sept 1994 68.

<sup>29</sup>RA Gardner 'You're not a paranoid schizophrenic — you only have multiple personality disorder' *Academy Forum* (American Academy of Psychoanalysis) 1994 Fall 11.

<sup>30</sup>Quoted in M Dickerson 'United we gripe' *Detroit News* 6 Nov 1994 B-1.

<sup>31</sup>R Hughes *Culture of complaint/the fraying of America* (New York: Oxford University Press, 1993) 7. The other week I received a call from a woman who said that she wanted a sodium amythal interview to learn whether she was abused as a child. She asked me for the name of a doctor who would do it. Why? She said, 'I'm interested in doing it. I just want to do it. I read about it and I want to find out about repressed memory. I want to do it for the sake of doing it.'

<sup>32</sup>The Foundation disseminates information about the nature of memory and about how to deal with these therapists.

<sup>33</sup>29 Nov 1993.

<sup>34</sup>24 May 1993.

*Yorker* ran a two-part article called 'Remembering Satan'.<sup>35</sup>

The American Medical Association has twice warned against the use of 'memory enhancement' techniques in eliciting accounts of childhood sexual abuse. The wording of its last resolution, in August 1993, was especially harsh. Dr Paul McHugh, Chairman of the Psychiatry Department at Johns Hopkins University, said, '[Recovery of memory] is the biggest story in psychiatry in a decade. It is disaster for orthodox psychotherapists who are doing good work.'<sup>36</sup>

Not only are patients and family members affected by 'revival of memory' but also the practice of therapy is impugned. Psychiatrists, long called the 'Rodney Dangerfields' of the medical profession, get little respect, and controversies like 'revival of memory' make it even more difficult to include mental health under insurance coverage. Aggrieved parents have urged health insurers to act as regulators of health care providers by not providing reimbursement to therapists who engage in 'revival of memory' of child sexual abuse. In most states anyone can hang out a shingle and use the title 'psychotherapist'.

Safe from the backlash are prosecutors who bring charges of sexual abuse against parents or others on the basis of little more than the flimsy evidence of a 'revived memory.' The prosecutors have governmental immunity. Some feminist prosecutors have used the occasion to voice rage against sexual abuse. Every movement has its fanatics and zealots, and the feminist movement is no exception.

Psychotherapists have long resisted the notion that they prove the value of what they do — and they claim confidentiality. When a patient sues a therapist, the privilege of confidentiality is waived, but when a third party sues, and the patient does not waive the privilege, the third party faces obstacles in obtaining information as to what went on in therapy.<sup>37</sup>

In what is called a landmark case in California, Gary Ramona sued a medical centre and a pair of psycho-therapists who he claims created false memories

<sup>35</sup>The two-part article appears in expanded form in L Wright *Remembering satan* (New York: Knopf, 1994); reviewed in M Kakutani 'A family is destroyed by a sexual chimera' *New York Times* 29 April 1994 B-7. For a review of recent books on revival of memory, see F Crews 'The revenge of the repressed' *New York Review of Books* 17 Nov 1994 54.

<sup>36</sup>Quoted in S Salter 'Recalling abuse in the mind's eye' *San Francisco Chronicle* 4 April 1993 9.

<sup>37</sup>The California Board of Behavioral Science stated: 'If a therapist is incompetent or grossly negligent in treating a client, the Board can investigate the particulars of that situation. However, it is virtually impossible for the Board to conduct such an investigation without the consent and cooperation of the actual client. The confidentiality of psychotherapeutic communication is protected by law and therapeutic treatment records cannot be obtained without a written release from the client, if the client is an adult.' Quoted in *Newsletter of False Memory Syndrome Foundation* 3 May 1994 7.

in his daughter of his sexually abusing her as a child.<sup>38</sup> He was humiliated. His lawsuit sought damages for emotional suffering from the breakup of his family, and for harm to his career and reputation. The daughter was satisfied with the therapy, she testified against her father, and she filed a lawsuit against him.<sup>39</sup> Confidentiality, as a result, was waived.

In Ramona's suit against the hospital and therapists, the trial court citing *Molien* rejected the defense's motion for summary judgment. The trial judge said:

This lawsuit is a compelling one, and it's a compelling one because it not only has the novelty of new and current legal issues, but also because it has a salient emotionalism to it. ... [T]he most interesting and compelling and difficult [issue] in this case ... is the question of whether a father may maintain a lawsuit against the therapists or other health care providers of his daughter alleging that he was damaged by their negligent treatment of her.

... I have found that a duty did exist to him by reason of the circumstances of the case under [California] Supreme Court law ... What's going on in a lawsuit of this sort is the conflict of policies. On the one hand, the defendants argue if you allow non-patients to sue health care providers, it will have a terrible, chilling effect upon the ability of any health care provider to do what his or her patient needs to provide the kinds of care that his or her patient needs to receive. How, they ask, is a health care provider to know what to do when presented with a patient who recalls or thinks he or she is recalling the sorts of things that are presented by this lawsuit. That's a big concern. That's an argument that has significant social implications attendant to it.

Of equal significance, however, and with equal social implications, is the question of what is somebody who, for the sake of this point we will presume to be factually innocent of having engaged in misconduct with respect to his daughter, to do if confronted with the unfounded and incorrect accusation of having molested her with results in his loss of everything?

It's as unpalatable to some to have health care providers put in the impossible situation of dealing with a patient presenting real problems but knowing that the health care providers might be subjected to liability as it is to others to have a falsely accused parent lose everything and have no recourse in court.

Those are the kinds of policy issues that the courts are called upon to resolve, because in the area of tort law, and this is a tort action, there's very little statutory law. There's very little law created by the legislature that creates norms ... And the purposes of tort law are twofold: to provide redress for people who are injured in some way or another; and to mediate, to control, to direct the conduct of other people ...

[I]n this case the rules are, from my point of view, fairly clear. They were made clear by the [California] Supreme Court in *Molien v Kaiser Foundation Hospital* in which a woman went to Kaiser Hospital, had a cause of action and could sue Kaiser Hospital for the emotional distress he suffered as a result of the negligent treatment of his wife, or the negligent diagnosis — misdiagnosis of syphilis.

The defense lawyers have argued vigorously, and with good reason that in the ten or twelve years since the *Molien* case was decided, the Supreme Court has

<sup>38</sup>*Ramona v Isabella, Rose & Western Medical Center* case no C61898 (1994); see K Butler 'Clashing memories, mixed messages' *Los Angeles Times Magazine* 26 June 1994 12.

<sup>39</sup>The statute of limitations does not begin to run until awareness of the cause of action. R Slovenko 'The 'Revival of memory' of child sexual abuse: is the tolling of the Statute of Limitations justified?' 1993 *J Psychiatry & Law* 7.

been narrowing its application. There's no question but that it has. That case, at the time it was presented to the Supreme Court, had the same kind of conflicts attending to it, the same kind of important policy issues that are present in this case.

The defense lawyers have argued that I should view the *Molien* case as being history; that the Supreme Court has whittled away at it so far that it no longer exists ... I think that the *Molien* case is still the law, because the Supreme Court has had numerous opportunities and has been asked on numerous occasions to simply say it is no longer the law ... Even as recently as late last year the Supreme Court was asked to do that, and they stressed that the reason Mr Molien had a cause of action was because of the instruction to his wife to go home and tell him about the diagnosis of her.

Well, think how similar that is to the allegation that the plaintiff is seeking to prove in this case, which is that not only did somebody tell the patient, go home and tell your father, but in fact, the father was summoned to the meeting and the confrontation and presentation of the charge occurred.

Holding that a duty of care is owed is by itself a victory for the aggrieved whatever the outcome of a trial. In cases where the defendant is said to owe a duty to the plaintiff, as we have noted, the defendant cannot avoid a trial by summary judgment.<sup>40</sup> It allows litigation, and the possibility of it may discourage irresponsible therapy. It also has public relations impact.<sup>41</sup>

In *Ramona*, the accusing daughter had sought therapy for an eating disorder. According to reports, the therapists suggested to her that the eating disorder was caused by childhood sexual abuse that she had repressed. The father was granted standing to sue the therapist no matter that the daughter was completely satisfied with the therapy. Dr Harrison G Pope, Jr, on the basis of research he had done on bulimia nervosa, testified for the plaintiff that evidence is wanting of a link between sexual abuse (even if it had occurred) and eating disorders.<sup>42</sup>

The daughter was also told that if she recovered a memory of abuse under sodium amythal, the memory of abuse would be historically accurate.<sup>43</sup> The plaintiff maintained that the daughter had succumbed to suggestion by manipulative therapists. 'The only time she had memories of her father abusing her was when the doctors told her after the amythal,' testified Dr Park Dietz, another expert witness for the plaintiff. 'Before the amythal she couldn't

<sup>40</sup>The jury awarded Gary Ramona \$500 00. It is reported that he has agreed to take a 'substantially less' amount in exchange for the defendants' agreement not to appeal. MJ Grinfeld, 'Impact of Ramona case uncertain' *Psychiatric Times* Oct 1994 1. One observer at the trial speculated that the jury made the award out of dismay at the outlandish fees charged by the defendant doctors. DS Chaffin (ltr) *Psychiatric Times* Oct 1994 17. The legal importance of the case, however, is that the judge allowed it to go to the jury.

<sup>41</sup>EF Loftus 'Therapeutic recollection of childhood abuse/When a memory may not be a memory?' *Champion* March 1994 5. See also Editorial 'No standards' *Wall Street Journal* 10 May 1994 18.

<sup>42</sup>HG Pope, B Mangweth, AB Negrao, JI Hudson & TA Cordas 'Childhood sexual abuse and bulimia nervosa: a comparison of American, Austrian, and Brazilian women' 1994 *Am J Psychiat* 732.

<sup>43</sup>J Gross 'Suit asks, does "memory therapy" heal or harm?' *New York Times* 8 April 1994 1.

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remember for sure who it was in those images she was having.<sup>44</sup>

Does the decision open the door to litigation by any person aggrieved by an interpretation made by a therapist to a patient? The decision has sent vibrations throughout the mental health profession. In an address at the 1994 annual meeting of the American Psychiatric Association, Dr Judith Herman, author of 'Trauma and Recovery', said about the *Ramona* case, 'The fact that a third party was given standing to speak on malpractice because he was not happy with the treatment of his daughter really opens the door to permit anyone who is dissatisfied with our treatment of any patient to lay claim against us.'

Hyperbole abounds. The court did not say that the public at large, one and all, may bring a claim against the therapist. Dr Herman acknowledged at the time of her address that she did not have access to the transcript or decision in the case.

In written commentary, Dr Thomas Gutheil, who testified on behalf of the defense in *Ramona*, asked: 'Whose therapy was this anyway? Should the father have been called in to approve each interpretation as it occurred to the therapist? Should the father's consent to the therapy have been sought, even though the patient was not a minor? Should the patient herself have been warned, in some caricature of the warning needed in a forensic context, that her therapy might conceivably be harmful to her father's peace of mind?'<sup>45</sup>

Not long ago, in a 'Murphy Brown' television program, a husband is told by his therapist that his wife is the cause of all of his problems and he is urged not to be passive but act aggressively. He takes out his anger on his wife. The wife complains to the therapist, 'Where do you get off telling my husband that I'm the cause of all his problems?'

Dr Gutheil posed a hypothetical scenario: 'Let's say a young man comes to treatment to work on trouble with relationships. A few years into psychotherapy, without any prompting by the therapist, the patient decides that the problem has been his failure to acknowledge that he is gay. Working this issue through, he feels much better — until he tells his parents, who are homophobic and become outraged at this news. They decide to sue the therapist for implanting foreign ideas or brainwashing or whatever.'

The scenario is what law professors call a parade of horrors, or slippery slope. The important fact, however, is that in *Ramona* the therapists operated on the basis of unsupported beliefs and urged the patient to blame someone for her problems. A resolution of the American Medical Association called for 'external validation' before assuming the authenticity of a patient's trauma

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<sup>44</sup>Quoted in B Hewitt & L Mullen 'A father fights back' *People* 6 May 1994 52; see also J Gross 'Heated closing arguments in "recovered memory" case' *New York Times* 12 May 1994 12.

<sup>45</sup>TG Gutheil 'True recollections of a false memory case', *Psychiatric Times* July 1994 28.

history. It took to task those whom they accuse of being unscientifically overzealous in believing or promoting a patient's trauma history. Traditionally, in psychotherapy, objective or corroborating evidence is not sought as it is considered unnecessary for therapy. In 'revival of memory' of sexual abuse, however, it may be incumbent given its impact on others. Dr Paul Appelbaum, representing the American Psychiatric Association, opined that it might be salutary if therapists were found liable in negligence to serve as a chastening lesson.<sup>46</sup>

The trial judge in *Ramona* relied on *Molien* where, it will be recalled, the patient was advised to inform her husband that she had syphilis. In a special verdict answering questions put to them, the jury concluded: (1) the defendants were negligent in providing health care to Holly Ramona by implanting or reinforcing false memories that the plaintiff had molested her as a child; (2) the defendants caused the plaintiff to be personally confronted with the accusation that he had molested Holly Ramona; (3) and the plaintiff suffered damages that were caused by the negligence of the defendants.

The same year, 1994, the Texas Supreme Court declined to recognize a legal claim that would allow lawsuits against mental health professionals by non-patients when the claim is based on a misdiagnosis of child sexual abuse.<sup>47</sup> The case arose in the context of a parental custody dispute and raised policy questions concerning the duties therapists owe to non-clients as well as the scope of protection that is available to reporters of child abuse. In this case, a psychologist, Esther Bird, examined the child, a 6-year-old boy, and reported that he had been sexually abused by his father. The therapist was inexperienced and the examination was perfunctory. In defense, the psychologist asserted there is no professional duty running to third parties as a matter of law, and regardless, her report was a part of the court litigation process, and consequently, privileged as a matter of law.<sup>48</sup> In upholding the trial court's grant of summary judgment, the court ruled: 'We hold that as a matter of law there is no professional duty running from a psychologist to a third party not to negligently misdiagnose a condition of a patient. We further reaffirm that a statement in an affidavit filed as a part of a court proceeding is privileged.'<sup>49</sup> It went on to say:<sup>50</sup>

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<sup>46</sup>See JR High (ltr) 'Abuse histories' *Psychiatric News* 21 Oct 1994 14.

<sup>47</sup>*Esther Bird v WCW* 868 SW 2d 767 (Tex 1994).

<sup>48</sup>A number of recent cases have denied witness immunity to experts receiving compensation from individual litigants. See EG Jensen 'When "hired guns" backfire: the witness immunity doctrine and the negligent expert witness' 1993 *UMKC L Rev* 185.

<sup>49</sup>868 SW 2d at 768. In *Cbatman v Millis* 517 SW 2d 504 (Ark 1975), a divorced husband brought an action against a psychologist alleging malpractice and defamation arising out of a report to his wife's attorney that he was a homosexual and should be denied visitation privileges. The court held that there must be a doctor-patient relationship for an action of malpractice but not for defamation.

<sup>50</sup>868 SW 2d at 769.

A claimant's right to sue a mental health professional must be considered in light of countervailing concerns, including the social utility of eradicating sexual abuse. Evaluating children to determine whether sexual abuse has occurred is essential to that goal ... Young children's difficulty in communicating sexual abuse heightens the need for experienced mental health professionals to evaluate the child. Because they are dealing with such a sensitive situation, mental health professionals should be allowed to exercise their professional judgment in diagnosing sexual abuse of a child without the judicial imposition of a countervailing duty to third parties.

In a widely publicized case in the late 1970s in Boulder, Colorado, a mother whose 25-year-old son had sued her for 'parental malpractice' filed her own suit against the son's psychiatrist, Dr Jeffrey Anker. The doctor had encouraged the son to sue her 'for therapeutic reasons.' (The demise of family immunity barring suits between family members began with the automobile accident cases and in these cases the insurance company is the defendant as a practical matter.) The son was described as a 'hippie' who was suspended from high school for selling marijuana, who chose to live with friends on a beach in Hawaii, and who refused to find work. In her suit, the mother said the 'parental malpractice' action against her caused her 'great grief, sorrow, and even anger' and she claimed that she had been subjected to widespread 'ridicule and embarrassment.' The case was apparently settled.<sup>51</sup>

#### Interference with family relations

Another approach is the old action in tort for 'interference with family relations' but this field of law has been described as 'rather ragged in form.'<sup>52</sup> It developed initially as an offshoot of the action for enticing away a servant and depriving the master of the quasi-proprietary interest in his services. Also, under the early common law, the status of a wife, as well as that of minor children, was that of more or less valuable servants of the husband and father, and that action was extended to include the deprivation of their services. In comparatively recent years, there has been a gradual shift of emphasis away from 'services' and toward a recognition of more intangible elements in domestic relations, such as companionship and affection. In a Washington case, an action for alienation of affections was allowed when a pastor counselled a woman to leave her husband who, the pastor said, was 'full of the devil.'<sup>53</sup>

Most jurisdictions have abolished a cause of action for 'alienation of affections.'<sup>54</sup> At one time the courts recognized a common-law cause of action for alienation of the affections of a husband or wife, though in general

<sup>51</sup>AP news-release, 'Sued mom turns law on psychiatrist' 17 May 1979.

<sup>52</sup>WP Keeton (ed) *Prosser and Keeton on the Law of Torts* (St Paul, MN: West 5 ed 1984) 915.

<sup>53</sup>*Carrieri v Bush* 69 Wash 2d 536, 419 P 2d 132 (1966).

<sup>54</sup>See, eg, *Gasper v Lighthouse* 533 A 2d 1358 (Md App 1987) (action by husband alleging malpractice against marriage counsellor after wife's affair with counsellor was alienation of affection and therefore precluded by virtue of the abolition of such actions).

no cause of action for the alienation of the affections of a child was recognized. The American Law Institute's Restatement of Torts sets out a formulation of the contemporary approach: 'One who, without more, alienates from its parents the affections of a child, whether a minor or of full age, is not liable to the child's parents.'<sup>55</sup> In *Schuppin v Unification Church*,<sup>56</sup> parents brought an action against the religious organization alleging that it alienated and estranged their daughter from her family and friends, thereby interfering with and impairing the parent-child relationship. In accordance with the position expressed in the Restatement, the court, like the majority of jurisdictions, declined to recognize a cause of action by a parent for alienation of a child's affections.<sup>57</sup>

What implication is to be drawn from the words 'without more', as used in the Restatement's formulation?<sup>58</sup> Compensation might be awarded if liability existed on another basis, such as abduction (trespass to person) or intentional infliction of mental distress. A number of states that preclude an action for negligent damage to family ties do permit suits for intentional damage.<sup>59</sup>

In another case decided in 1994, *Sullivan v Chesbier*,<sup>60</sup> a federal court permitted a third party (the parents) to sue a psychologist based on revival of memory. The parents sued on a number of theories. They claimed, among other things, that the defendant created a public nuisance through the unlicensed practice of clinical psychology; intentional and reckless infliction of emotional distress; and intentional injury to their family relationship. The psychologist sought summary judgment under the theory that only the patient may sue for damages caused by estrangement. The court ruled that the parents' nuisance and intentional tort claims were valid.<sup>61</sup>

<sup>55</sup>Restatement (Second) of Torts § 699 (1977).

<sup>56</sup>435 F Supp 603 (D Ve 1977).

<sup>57</sup>See *Orlando v Alamo* 646 F 2d 1288 (8th Cir 1981); *Hyman v Moldovan* 166 Ga App 891, 305 SE 2d 648 (1983); *Scholtz v Scholtz* 177 NJ Super 647, 427 A 2d 619 (1980); *Edwards v Edwards* 43 NC App 296, 259 SE 2s 11 (1979); *Bock v Lindquist* 278 NW 2d 326 (Minn 1979); *McGrady v Rosenbaum* 62 Misc 2d 182, 308 NYS 2d 181 (1970), *aff'd* 37 AD 2d 917, 324 NYS 2d 876 (1971); *Ronan v Briggs* 351 Mass 700, 220 NE 2d 909 (1966); *Pyle v Waechter* 202 Iowa 695, 210 NW 926 (1926).

<sup>58</sup>See *Morris v Bruney* 78 NC App 668, 338 SE 2d 561 (1986); *Bartanus v Lis* 332 Pa Super 48, 480 A 2d 1178 (1984); Right of Child or Parent to Recover for Alienation of Other's Affections 60 ALR 3d 931 (1974). In *Strode v Gleason* 9 Wash App 13, 510 P 2d 250 (1973), the court recognised a parental action for 'malicious' alienation of the affections of a minor child. Malice was defined as an unjustifiable interference with the parent-child relationship. This was preserved when the court decided to abolish actions for alienation of the affections of a spouse. *Wyman v Wallace* 15 Wash App 395, 549 P 2d 71 (1976), *rev'd* 91 Wash 2d 317, 588 P 2d 1133 (1979) reinstated, 94 Wash 2d 99, 615 P 2d 452 (1980).

<sup>59</sup>See, eg, *Siciliano v Capitol City Shows* 124 NH 719, 475 A 2d 19 (1984); *Surina v Lucey* 168 Cal App 3d 539, 214 Cal Rptr 509 (1985).

<sup>60</sup>846 F Supp 654 (ND Ill 1994).

<sup>61</sup>At the same time, the court ruled that the tort claims were barred by the statute of limitations, and thus they were dismissed. 846 F Supp at 6670.

### Conclusion

Actions against 'revival of memory' therapists can fall under the general principle that all persons are required to use ordinary care to prevent others from being injured as a result of their conduct. The pertinent factors to consider include the foreseeability of harm to the plaintiff, the degree of certainty that the plaintiff suffered injury, the closeness of the connection between the defendant's acts and the harm suffered by the plaintiff, the moral blame attached to the defendant's conduct, and the policy of preventing future harm.<sup>62</sup>

Professor SA Strauss has noted that the law of torts is evolving regarding the responsibility of therapists not only to their patients but also to third parties reasonably foreseeable as victims of harm caused by their patients. In many circumstances, the duty of the therapist runs not only to the patient but also to others.<sup>63</sup>

<sup>62</sup>*Bastian v County of San Luis Obispo* 199 Cal App 3d 520, 245 Cal Rptr 78 (1988).

<sup>63</sup>SA Strauss *Doctor, patient and the law* (Pretoria: JL van Schaik, 3 ed 1991).

# Alcoholism: some medico-legal issues

LS SMITH\*

Although I was well aware of Professor Strauss's many publications and had on many occasions heard his views quoted with great respect by Professors 'Polly' Turner, 'Okkie' Gordon and Hillel Shapiro, the then doyens of forensic medicine, it was not until 1968 that I had the privilege of meeting this fine gentleman. The meeting was at a Group discussion convened by the Secretary for Health shortly after the first human heart transplantation, by the Cape Town Transplant Team.

I had been involved in some aspects of the preparative endeavours, and in anticipation of the procedure had had consultations with the then Attorney General the late Mr W van den Berg, and had authorised the removal of the donated heart from the body on which I was to undertake a post mortem examination that day, in terms of the provisions of the Inquest Act.

This Group was to consider whether the Post Mortem Examination and Removal of Human Tissue Act (30 of 1952) as amended by Act 49 of 1961, needed further amendment. In the relevant subsequent legislation and in much of the ensuing health and welfare orientated legislation, Sas, with his convincing ways and wisdom, experience and understanding often played a major role tempering the over enthusiasm of his medical colleagues.

His guidance was often sought, not only by the National Health Authority, but equally so by the various provincial and private hospital organisations. Medical practitioners and members of the nursing profession were at all times made to feel at liberty to seek his advice, of which he gave so willingly. These unstinting endeavours have, in a large measure, contributed to a better understanding between doctor, nurse, patient and the legal profession.

In recognition of his services the Medical Association of South

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Africa bestowed upon him the richly deserved singular honour of life membership for 'meritorious services rendered to the medical profession'.

Presently, as a member of the Medical Research Council's Ethical Committee, he continues to serve the needs of his fellow man with distinction.



### Historical

Alcoholic beverages have been part of social custom since earliest recorded time, and its effects on behaviour and health clearly identified in biblical writings. Risks even more so today as the tempo and demands of life require greater skill and judgement. Noah was probably the first recorded alcoholic. (Genesis 9:21). Lot's daughters plied their father with drink to suit their own nefarious ends: 'Come let us make our father drink wine' (Genesis 19:32).

Samson's mother was counselled to avoid alcohol to ensure a successful pregnancy as it seems that even in those times there was an awareness of the 'foetal alcohol syndrome' (Judges 13:4).

Wine gives false courage ... which leads to brawls' (Proverbs 20:1), indeed so true of present day violence.

'What wonders does not wine! It discloses secrets, ratifies and confirms our hopes — thrusts the coward forth to battle. It eases the anxious mind of its burden — instructs the Arts, Whom not quite free and easy of pinchbeck poverty.' (Horace 56BC)

In the New Testament the drinking of wine at social gatherings appears to have been acceptable, (John 2:12) although later texts warn against the health hazards related to alcohol abuse (Ephesians 5:18).

Was it not Macduff who asked: 'What three things does drink especially provoke?'

Porter: 'Marry sir, nose painting, sleep, and urine. Lechery sir, it provokes and unprovokes, it provokes the desire but takes away the performance ...: (Macbeth Act 2 Scene 3.)

(See Table A, page 249.)

Candy is dandy, but liquor is quicker.' (Ogden Nash)

The alchemist Lully (1235 - 1315 developed a method of making 'pure' alcohol and enthused, 'of marvellous use and commodite and little before joyning battle to styre and encourage the soldiers' minds' .. it's taste exceedeth all other tastes, and the smell of it all other smells'. What he was smelling and tasting was probably the congeners in his distillate, as alcohol (C<sub>2</sub>H<sub>5</sub>OH) is tasteless and odourless.

How much history must have been determined by these effects of alcohol?

### Metabolism of alcohol

Man has fortunately been provided during evolution with a specific enzyme mediated pathway directed to the breakdown of alcohol to its final innocuous constituent parts CO<sub>2</sub> and H<sub>2</sub>O, coupled with the ability to eliminate the remaining alcohol, about 10% via largely the breath and urine.

About 90% of the absorbed alcohol is oxidised initially in the liver to acetaldehyde by alcohol dehydrogenase (ADH) assisted to a lesser degree when high blood levels of alcohol are reached by a microsomal ethanol oxidising system (MEOS) Acetaldehyde which accounts for many of the acute and chronic toxic effects associated with the imbibing of alcohol is broken down further by acetaldehyde dehydrogenase (ALDH) to acetate and then by an ensuing pathway to carbon dioxide and water.<sup>1</sup> (See *Figure 1*, page 243.) This process can account for about 10g of ingested alcohol per hour (equivalent to a little more than one tot of spirits per hour), resulting in a rectilinear fall in the blood alcohol level of 0,01 to 0,02g per 100ml blood after the absorption peak has been reached. Retinal ADH also oxidises methyl alcohol to a very toxic formaldehyde which may result in blindness associated with the imbibing of illicit brews especially during 'Prohibition'. In this regard 'methylated spirits' in the RSA contains 95% ethylalcohol (alcohol) and small amounts of butyl alcohol, as well as pyridines, naphthas, and colouring. Ethyl alcohol is used therapeutically to treat methyl alcohol poisoning by competing preferentially for the ADH activity so limiting the availability of this enzyme to break down the methyl alcohol to formaldehyde, whilst the methyl alcohol is being excreted as such in the urine and breath.

### Effects of alcohol on the central nervous system

The early manifestations of alcohol intoxication are thought to be due to the preferential involvement of polysynaptic neuronal pathways in the reticular formation of the brain stem, cerebral cortex and cerebellum. One of the most likely sites of ethanol's intoxicating effect is a complex of cell membranes containing a receptor for the neurotransmitter gamma-aminobutyric acid (GABA) and an associated chloride-ion channel. In electrophysiologic studies alcohol potentiates the GABA-activated inhibition of cerebral cortical neurones.

An excitory amino-acid receptor with a preferential affinity of N-methyl'-d-aspartate has been implicated in the process of memory and learning, of which alcohol is a potent inhibitor.<sup>2</sup> (See *Figure 2*, page 244.)

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<sup>1</sup>RJ Hift 'Interactions of alcohol and drugs' 1991 *CME* 849-856; CS Lieber 'Ethanol metabolism' 1978 *N Eng J Med* 356.

<sup>2</sup>ME Charness, PS Roger & DA Greenberg 'Medical progress: ethanol and the nervous system' 1989 *New England J of Medicine* 442-454; FK Goodwin 'Alcohol effects on action of GABA' 1989 *JAMA* 260 4; JA Temlett 'Neurological effects of alcohol' 1991 *CME* 839-848.

### Foetal alcohol syndrome

Modern epidemiological studies have demonstrated that the dangers to both foetus and mother who drink more than about 40ml of alcohol per day could be profound and life long, and that alcohol abuse during pregnancy is the leading cause of drug induced teratogenesis<sup>3</sup>, with a prevalence of from 1 in 1000 live births. This danger may manifest as growth and mental retardation, including microcephaly and congenital cardiac defects. Furthermore spontaneous abortion is twice as likely in women who drink during pregnancy. Although three drinks per day during pregnancy triples the risk of mental retardation in the offspring there is uncertainty as to the amount or frequency or at what stage of pregnancy the risk is greatest.<sup>4</sup>

Other studies suggest a linear relationship between the amount of alcohol and the degree of mental and physical abnormality, but are unable to establish a threshold for adverse effects. It is thus prudent to advise all women to avoid all alcoholic beverages during pregnancy. Certainly a duty which befalls all those responsible for the care of the expectant mother.

The question which inevitably arises is, if the risk exists, whether this is of such an order to advise a therapeutic abortion in terms of the Abortion and Sterilization Act, certainly a very subjective decision. It seems illogical that despite medicine control authorities' world-wide going to great lengths to ensure that similar risks are clearly identified to the prescriber in the package insert, and readily available to the patient, yet the same is not required of the marketers of what has been termed as the most potent psychoactive dependence producing drug readily and lawfully available, the sale of which is persuasively advertised (during 1991 R114,2 million was spent on advertising in South Africa) without at least a warning label.<sup>5</sup> The outcome of a civil action arising out of the effect of alcohol on the mother and or the foetus may be revealing, as would an action by the retarded child against the mother who, aware of the inherent dangers to her foetus, continued to abuse alcohol during the child's intrauterine life.

### Insurers

#### *'Exclusion clauses' and related matters*

In view of the risks associated with the acute and long term abuse of alcohol, both functionally and physically, it is not unexpected that insurers, make specific provision in the policies which they market with regard to such abuse and the consequences thereof.

The phrasing of these 'clauses' (examples of which follow) are matters for debate.<sup>6</sup>

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<sup>3</sup>The production of physical defects in offspring in utero.

<sup>4</sup>SM Wiseman, PV Tomson, JM Barnett & Jenns M Wilton 'Use of an alcometer to detect problem drinkers' (1991) 285 *BMJ* 1085-1090; JJ Llinas 'Dependence on alcohol' in 1992 *The Merck Manual* (16ed) 1551-1556, 2009.

<sup>5</sup>C van den Burgh comp. SANCA Report 1992.

<sup>6</sup>Life Offices Association, Cape Town 1995.

- 'Exclusions (applicable only in the event of disablement) This benefit does not insure against: bodily injury sustained whilst under the influence of intoxicating liquor or drugs or disablement due wholly or partly to the effects of intoxicating liquor or drugs not taken in accordance with treatment prescribed and directed by a qualified, registered medical practitioner but not for the treatment of drug addiction.'
- 'Limitations and exclusions: ... shall not be liable under this supplementary contract should disability be wholly or partly, directly or indirectly caused by or traceable to abuse of alcohol or drugs, any violation of the criminal law by the life assured.'
- 'We will not be liable under this policy for any benefit payment if the claim is in our opinion wholly or partly, directly or indirectly caused by or traceable to ... abuse of drugs or alcoholic liquor ... or ... any violation by the life assured of the criminal law.'
- '... the benefits shall not come into operation where disability is caused by injury or sickness which arose directly or indirectly from or is traceable to any of the following: an act by the assured while he is under the influence of alcoholic liquor or drugs or while the alcohol content of his blood is 0,16 grammes or more per 100ml, taking of alcoholic liquor by the assured or of drugs or medicaments not in accordance with medical prescription, ...'
- 'Exclusions: No benefit is payable in terms of this policy if, at the sole discretion of ..., the injury or illness arises directly or indirectly from, or is traceable to any of the following: Wilful exposure to danger, self-inflicted or wilful injury, attempted suicide, abuse of or dependency on alcohol, drugs or medicaments not prescribed by a medical practitioner.'
- '... will not consider any claim for benefits if the event causing death or disablement was brought about or accelerated by any of the following: ... intentional intake of alcohol or drugs ...'.
- 'The effects of alcohol or drugs, other than drugs taken in accordance with treatment prescribed and directed by a qualified registered medical practitioner or pharmacist.'
- 'Any act or deed committed by the life assured in violation of any criminal law' and in the case of the Multilateral Motor Vehicle Accidents Fund Act 93 of 1989.
- '... agents recourse against the owner of a motor vehicle shall only be applicable ... in any case where, at the time of such accident ... under the influence of intoxicating liquor or drug to such a degree that his condition . . . the sole cause . . . ' and, in the case of State employees Treasury Instructions — Exchequer Act 66 of 1973.
- '... made excessive use of alcohol or drugs (for which there is sufficient proof) which may have resulted in or contributed to liability.'

The medical issues inherent in these provisos, relate inter alia to medi-

cine/alcohol interaction, what constitutes 'under the influence', alcohol as a cause of disability, alcohol dependence, trauma and accident causation, establishing the amount of alcohol consumed, blood alcohol back calculations from sampling time to event, the validity of a sample as representing the blood level at the time sampling.

### Medicine and alcohol interaction

The potential for interaction between alcohol and medicines as well as with drugs of abuse and the possible grave consequences cannot be over emphasised; consequences relating not only to disturbed behaviour and performance patterns but also to the physical health of the victim of such interaction. (See *Table B*, page 250.)

Antabuse (disulfiram), a drug used in the treatment of alcoholism, inhibits ALDH activity thus preventing the conversion of acetaldehyde to acetate with a resultant build up of acetaldehyde in the blood when alcohol is imbibed, even in small amounts, and producing a well recognised syndrome manifesting as nausea, headache, tremulousness, intense facial and conjunctival flushing, tachycardia, giddiness, confusion, and which on rare occasions may be life threatening. A person on Antabuse therapy must be warned to avoid driving a motor vehicle should they consume even as little as a single tot of drink, as these symptoms may then present and be attributed to alcoholism. Whereas Antabuse is prescribed specifically in the treatment of alcohol abuse, to elicit a revulsion effect, a similar reaction may ensue when alcohol is taken whilst on medication for other conditions. These medicines include certain anti-diabetics (Diabinese), antibiotics (Flagyl and cephalosporins).<sup>7</sup>

It is of interest to record that 85% of Japanese have a hyperactive ADH system, which is about five times faster in action than in the case of others. The intake of alcohol results in a rapid build-up of acetaldehyde which the normal level of ALDH is unable to metabolise timeously, with an ensuing Disulfiram reaction. Despite the fact that the ingestion of a given amount of alcohol does not reach the expected level a Disulfiram effect may be accompanied by signs and symptoms suggestive of a far higher blood alcohol concentration (BAC).<sup>8</sup>

Interaction may result in a synergistic reaction, a merely additive effect exemplified in the case of benzodiazapines and antihistaminics, and alcohol. The interaction with benzodiazapines may not infrequently result in disorientation hyperexciteability aggression and rage, resulting in behaviour out of keeping with the individual's behaviour pattern.

Triazolam has been associated with adverse psychiatric reactions sometimes linked with violent acts. During 1991 an American woman was acquitted of murdering her mother whilst under the influence of this drug. She was awarded an out of court settlement, by the manufacturer, which amounted to

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<sup>7</sup>RJ Hift 'Interactions of alcohol and drugs' 1991 *CME* 849-856.

<sup>8</sup>FJ Goldstein 'Pharmacodynamics: pharmacogenetics' in 1992 *The Merck Manual* (16ed) 2694.

a substantial amount. In the UK a 54 year old man, whom the Court found to be of 'exemplary character' was charged with the murder of his elderly woman neighbour, whom he had befriended, by strangulation. Despite the fact that he was known to have an 'alcohol problem' he had been prescribed Triazolam for his insomnia. He had taken an overdose in a suicide attempt, it is presumed, the night before the killing. He had vomited shortly after having taken the overdose. He overslept the next morning to feel on awaking 'confused and muddled' and drank lager and whisky. That evening the woman was strangled. A consultant psychiatrist explained that 'the combined effect of Triazolam and alcohol could lead to impaired recollection of recent events and to certain inexplicable actions, including attacks on persons, and suggested that at the time he may have been' the victim of automatism. There was much argument at the trial about how much of the drug was still in the accused's body at the relevant time, as it was assumed if all the drug and its metabolites had been cleared from the body there would be no residual effects, of any significance. However the effects of the drug, as well as that of the alcohol, persist, and withdrawal symptoms occur only when blood concentrations are very low. Pharmokinetic factors coupled with clinical studies suggest that the rapid elimination of large amounts of Triazolam, would produce intense withdrawal-like symptoms.<sup>9</sup>

Alcohol has a hypoglycaemic inducing effect, and thus when taken concurrently with antidiabetic medications, especially so with oral antidiabetics, may cause a dramatic fall in the blood sugar level (hypoglycaemia) resulting in excessive sympathetic nervous system stimulation, coupled with central nervous system dysfunction, as the brain is dependant on an adequate sugar supply as it's major source of fuel. The former gives rise to sweating, tremulousness, and a sense of faintness, the latter to confusion, inappropriate behaviour resembling alcoholic inebriation, visual disturbances (blurring), which may proceed to stupor, coma, seizures, irreversible neuronal damage and death if not diagnosed and promptly treated. It is important to appreciate that alcohol induced hypoglycaemia may occur at blood alcohol levels below 0,08g%.<sup>10</sup> The situation may arise and indeed has been reported, where an arrest and incarceration on a mistaken charge of drunkenness has had disastrous consequences. The hazard is not peculiar to arrest, but also presents itself as a diagnostic challenge in the trauma and emergency units of hospitals.

Benzodiazapines and alcohol may compete for metabolism resulting in a delayed metabolic rate for both and hence a prolonged effect. Alcohol and drug interactions may be protean in nature and associated with a variety of different drugs. Even aspirin may have side effects enhanced by the concur-

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<sup>9</sup>C Medawar & E Rassaby 'Triazolam overdose, alcohol and manslaughter' 1991 *Lancet* 1515.

<sup>10</sup>D Bradshaw 'A profile of violence and injury mortality in the Cape Town Metropole' 1989 *SA Medical Research Council, Community Health Group Draft Technical Report*.

rent use of alcohol as in the case of gastrointestinal bleeding. 'As the New Year dawns, the light is too bright the mouth feels as if it has been used as a latrine by some small creatures at night, and a dull headache beats in time with the pulse, many will reach for an aspirin if the headache permits them to move at all, not only are they at the risk of inducing a gastric haemorrhage, but since aspirin may also inhibit gastric ADH, should this be washed down with the 'hair of the dog', the bio-availability of the ingested alcohol may be enhanced. The hepato-toxic risk of paracetamol is enhanced in alcoholics, and their tolerance to other drugs enhanced, and the fatal dose of barbiturates significantly reduced with concurrent alcohol ingestion.'<sup>11</sup>

Caffeine containing substances like coffee may accentuate the effects of alcohol, and it is alleged may even increase accident-proneness. Certain experimental benzodiazepine-like substances bind with the site of action of alcohol at neuronal level, blocks the effect of alcohol on neuronal activity, and even at elevated BAC levels usually associated with overt intoxication no evidence of the effects of alcohol taken subsequent to the administration of this agent may be elicited<sup>12</sup>.

It is conservatively estimated that there are 1,025,198 alcoholics in South Africa, identified as those who consume a minimum of 10cl on average per day. This represents 5,8% of the total population over the age of 15 years.<sup>13</sup>

An estimated 75% of South Africans consume alcohol and the concurrent use of alcohol and medicine is statistically a great risk, and especially so where the patient is not warned to avoid his customary drink whilst on treatment.<sup>14</sup> (See *Table C*, page 250.)

The topic of drug and alcohol interaction is a complex pharmoco-dynamic exercise and when this becomes an issue medico-legally the opinion of the pharmacologist is essential.

In emphasising the dangers of alcohol/drug, interaction Kielholz refers to his experimental work with 320 members of the Basle city police corps. The volunteers with a BAC of 0,08% were given a therapeutic dose of one of one of the following drugs: chlordiazepoxide (20mg); mepobromate (800mg); phenobarbitol (200mg); and methylprylon (200mg), which increased the number of test driving faults when compared with the effects of the drugs alone by about '200%, 300%, 100%, and 210% respectively'.<sup>15</sup> In another study the complexity of the problem was highlighted by Garriot. Seventy four

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<sup>11</sup>R Roine, RT Gentry, R Hernandez-Munoz, E Barsona & CS Lieber 'Aspirin increases blood alcohol concentrations in humans after ingestion of ethanol' 1990 *JAMA* 2406-2408.

<sup>12</sup>'Report ärztliche Praxis' quoted in 1987 *SAMJ* (Editorial) xii 'Anti-drunkenness pill?'

<sup>13</sup>'Sweden lowers blood alcohol limit for drivers' 1990 *BMJ* (Editorial) 1482.

<sup>14</sup>*Ibid.*

<sup>15</sup>P 'Kielholz Drugs and Driving in Switzerland. Alcohol, Drugs and Road Safety'. Sixth International Conference on Alcohol and Drugs and Road Safety. Toronto, 1974. (Addiction Research Foundation, Toronto).

per cent of drivers arrested for apparent 'drink and driving' and who had 'low blood alcohol concentration', 41% tested positive for barbiturates, 15% for diazepam and 22% for methaqualone.<sup>16</sup> The pattern of this drug related interaction will vary from country to country being determined by the availability of the various drugs, as well as the prescribing and abuse customs prevailing locally. Furthermore although it may be assumed that psychoactive drugs add to the sedative and toxic effects of alcohol at clinical examination, in the absence of established blood levels, it is not possible to determine to what extent each is contributing to the impairment observed.

### Under the influence

The expert medical witness should be clear in his own mind what he understands by 'under the influence of alcohol'. (See *Table G*, page 253.) Strictly speaking this is applicable when it can be established that the subject's blood contains alcohol which is exerting some measurable effect on neuronal function albeit ever so slight. It has been suggested that the term should be used to describe any abnormal mental or physical condition which is the result of indulging in any amount of alcohol and which deprives the subject of that clearness, intellect and control which he would otherwise exercise up to a state where death from alcohol poisoning may be at hand.<sup>17</sup>

Not infrequently the intensity of smell of the alcoholic beverage on the subjects breath is erroneously used as a measure of the degree of intoxication, but this is due to the congeners of the drink and may persist in the breath after all the alcohol has been eliminated, and furthermore the intensity will also depend on the nature of the beverage.<sup>18</sup> It is also worth noting that for the same reason the blood may contain significant amounts of alcohol without imparting any smell to the expired air depending on the beverage imbibed.

All the signs and symptoms customarily attributed to acute alcoholic intoxication, individually, are not peculiar to the effects of alcohol, but are merely the result of the depressant action on the central nervous system which can be mimicked by any substance with the same neurological target. Taken as a whole the pattern increases the probability that the picture presenting is due to alcohol, pending laboratory, or breath analysis confirmation, but even so the extent to which other factors may be influencing the clinical picture may often be difficult to elucidate. This is especially true where a driver has been extricated from a vehicle involved in an accident. (See *Table D*, page 251.)

Any equally vexing problem diagnostically is the differentiation between certain natural diseases such as hypoglycaemia, post epileptic confusional states, and particularly so when alcohol has been consumed and again resort to laboratory tests may be necessary.

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<sup>16</sup>WE Cooper, TG Schwar & LS Smith *Alcohol, drugs and road traffic* 1979 362.

<sup>17</sup>*Ibid* 154.

<sup>18</sup>*Ibid* 166.

That the clinical diagnosis is often correct in the case of the uninjured is rather a measure of the widespread use of alcohol than reflecting on the specificity of the clinical examination.

Although there is in most cases in broad terms, a fairly close correlation between the BAC and the degree of clinical intoxication, the intensity of impairment is generally more marked on the rising blood alcohol tide than at the same level on the falling tide (Mellanby effect). (See *Table E*, page 251.)

This is thought to be due to the development of an acute neurotolerance, in contrast to the tolerance, which is not short lived as in some alcoholics, and which may follow on a long pattern of excessive alcohol consumption. This may result in apparent soberness at BAC, as high as 0,20g% where frank intoxication would be expected, and even survival at levels as high as 1,00g%. This it is postulated may be due to the development of permanent adaptive changes in the former sensitive cellular components of the nervous system, such as membrane lipids, neurotransmitter receptors, ion channels, G proteins and intracellular second messengers that counteract the short term effects of alcohol.<sup>19</sup>

In the words of a medical practitioner, of many years standing, who has examined very many persons arrested on a charge of drink and driving, 'each test carried out is independently questionable' as a diagnostic tool, but 'when taken as a whole ... can ... indicate that there is definitely faculty impairment, which is 'likely to have been caused by alcohol', and stresses the importance of differentiating between the terms 'possible, likely, and probably' in relation to the conclusions to be drawn from the clinical examination. He continues 'the occasion will most certainly arise, when like all of us, with the certainty (in your own mind) that the suspect is under the influence but you could not find any positive reasons to certify him as such. Your examination may reveal no conclusive abnormality, yet the analyst may report a blood alcohol content of nearly 0,3g/100ml ... but rest assured that nobody can fault you for admitting you do not know the answer'.<sup>20</sup>

The dose-response relationship is an important parameter to be considered in an evaluation of a blood alcohol test result. Once the blood alcohol has reached equilibrium with the tissues and especially the brain a broad probable clinical picture is predictable at a given BAC provided the response has not been modified by concurrent medication, drugs of abuse or organic functional mental disorder.<sup>21</sup> (See *Table F*, page 252.) In such predictions the importance of bearing in mind the sigmoid character of the graphically depicted dose-response curve, at the extremities of which wide variations

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<sup>19</sup>ME Charness, PS Roger & DA Greenberg 'Medical progress: ethanol and the nervous system' 1989 *New England J of Medicine* 442-454.

<sup>20</sup>VD Kemp 'Some random thoughts on the examination of "drunken drivers"' 1986 *SAJ Continuing Medical Education* 29-31.

<sup>21</sup>LC le Roux & LC Smith 'Violent death and alcoholic intoxication' 1964 *J For Med* 131-141.

between the clinical picture and the BAC are encountered, whereas at the 50% point a small variation in the dose of alcohol will include the majority of subjects. This phenomenon is exemplified in Jetter's experimental work<sup>22</sup> (see *Figure 3*, page 245) and is not confined to inter-individual differences but may also manifest in the same individual at different times.

In an attempt to summarize existing knowledge of drink and driving in order to achieve a clearer appreciation of the significance of blood alcohol levels, a group of distinguished Australian scientists prepared the following statement for the Law Reform Commission

- For blood alcohol levels of 0,05%, and below, some individuals are impaired by alcohol but most drivers, even if affected, are affected only slightly. While deterioration in performances of tasks related to driving can be demonstrated 0,05% increased liability to accident appears first somewhat above 0,05%. It is therefore, reasonable to say that at blood alcohol levels of 0,05% or less the person concerned is unaffected, in a practical sense, as regards road safety.
- Blood alcohol levels in the range of 0,05 to 0,10%. All individuals are affected at or before 0,10% is reached. In some people this may be largely compensated by slower or more careful driving — but even in these cases the person concerned is less able to cope with the demands made on his driving ability in emergency situations which often precede accidents and to this extent alcohol in this range is a contributing factor towards accidents. It is in this range that measurably increased liability to accident appears, taking drivers as a group.
- Drivers with blood alcohol levels above 0,10% are affected to the extent that their driving becomes distinctly impaired. The impairment increases progressively as the blood alcohol level rises until at levels of 0,15% there is substantially increased liability to accident.
- At levels of 0,20% and above most people are obviously intoxicated. The increased risk of accidents is now severe.

### Alcohol and disease causation

Every organ in the body is a potential target of alcohol especially where this is abused on a long term basis. The clinical manifestations are often delayed, and may even present after years of abstinence. Severe bleeding may follow on a retching bout causing tears of the oesophageal mucosa after an alcoholic debauch, as may also be the case in acute gastric erosions and acute pancreatitis, serve as examples of the acute effects.<sup>23</sup>

Well documented consequences of chronic alcohol abuse include a wide spectrum of liver disease, including cirrhosis of the liver which may progress

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<sup>22</sup>WW Jetter 'Studies in alcohol: diagnosis of acute alcoholic intoxication by correlation of clinical and chemical findings' 1938 *Amer J Med Sci* 481.

<sup>23</sup>E Buchel 'Alcoholism and the GIT' (1991) 97 *CME* 815-823; CS Lieber 'Ethanol metabolism' (1978) 298 *N Engl J Med* 356.

further to malignant tumour, years later.<sup>24</sup> Alcohol is the most common cause of pancreatitis, a very disabling condition often associated with intractable pain, sufficient to induce suicidal tendencies.

Ailment is not confined to the gastro-intestinal system. Central and peripheral nervous and cardiovascular disorders are commonly attributable to alcohol abuse. In the case of the latter it has been recognised for over a century that cardiac failure, rhythm disturbances and hypertension may ensue due to the direct effect of alcohol or its metabolite acetaldehyde on cardiac muscle. Social drinking can precipitate arrhythmias and sudden death in persons with cardiopathy, and especially so should this be accompanied by a stress incident, such as even a trivial assault or dispute. Even in 'normal' subjects ingestion of alcohol over a period of 1 to 2 hours resulting in a BAC of about 0.10g% has resulted in measurable depression of left ventricle function.<sup>25</sup>

Genetic factors may also influence the susceptibility to neurological complications. Abnormal thiamine dependent enzyme may be the reason why only some malnourished alcoholics develop the Wernicke-Korsakoff Syndrome. Of medico-legal significance in that it is characterised by gait disturbances, confusion and memory defect which may be relevant in the clinical assessment of intoxication as are so many other neurological complications of alcohol abuse, and also by as a striking feature -confabulation, the substituting of imaginary or confused 'experiences' for that which cannot be recalled, and often so convincingly as to deceive an astute observer. Emotional changes may develop to a stage where even fear inducing situations may evoke little response, or a totally misdirected one.<sup>26</sup>

### Alcohol dependence

Alcohol dependence may best be defined as a state arising out of the chronic abuse of alcohol which on withdrawal results in physical and/or mental manifestations of withdrawal such as tremulousness agitation hallucinations delusions and a craving for alcohol.

The addicted person is identified by frequent bouts of intoxication which interfere with his ability to socialise and work productively, repeated loss of employment and injury, marriage failure, arrest for drunkenness and the presentation of typical withdrawal signs and symptoms as so often happens on admission to hospital following injury.

Research has provided convincing evidence that the vulnerability to dependence is at least partly due to inherited factors manifesting on exposure to alcohol. The importance of genetic determinants is supported by the familial nature of this condition since there is a significantly higher concordance rate in identical twins than in fraternal twins, and a fourfold higher risk for children

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<sup>24</sup>AS Mitha 'The cardiologist and the alcoholic' 1991 *CME* 804-810.

<sup>25</sup>*Ibid.*

<sup>26</sup>JA Temlett 'Neurological effects of alcohol' 1991 *CME* 839-848.

of alcoholics even when adopted out of birth. Furthermore sons of alcoholics have a decreased sensitivity to alcohol's psychological effect and often have altered electroencephographic tracings after the intake of alcohol.<sup>27</sup>

Inherent in this condition are a number of potential issues such as divorce, consent, vicarious liability, employment in dangerous occupations, and the implementation of relevant abuse orientated legislation. The severe confusional state which may accompany sudden withdrawal accompanied by agitation may present within about four days of withdrawal, or reduction in the drinking pattern.<sup>28</sup>

Acute and chronic alcoholism may result in blackouts (palimpsests), with periods of amnesia which cannot be accounted for by the depressant action of alcohol per se. These tend to occur after or even during the short term imbibing of large amounts of alcohol and are characterised by the inability to form new memory but with no impairment of long or intermediate term recall. Attempts to jog the memory are ineffective and indeed run the danger of false recall which the individual may believe to be true. Recognition of this phenomenon is essential before regarding these memory hiatuses as a convenient lapse or deliberate confabulation.<sup>29</sup>

Measurement of serum enzyme GGT and red blood cell mean corpuscular volume will help identify 3 out of 4 heavy drinkers even before clinical liver changes are identifiable, provided sampling takes place within 48 hours after the last drink, but will rise once again on resumption of alcohol intake.<sup>30</sup>

A group of young alcoholics with no apparent signs of neurological impairment had significantly reduced metabolism in the brain as assessed by positron emission tomography (PET). PET is a sensitive indicator of cerebral dysfunction in alcoholics with very minimal brain structure changes on magnetic resonance imaging (MRI). MRI, PET, and neuropsychological tests were used to evaluate brain structure, regional brain metabolism and neuropsychological performance in 10 apparently healthy alcoholics and 10 normal matched males as controls. The neuropsychological assessment included tests for cognition, memory, motor coordination and language usage.

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<sup>27</sup>ME Charness, PS Roger & DA Greenberg 'Medical progress: ethanol and the nervous system' 1989 *New England J of Medicine* 442-454; J Chick, N Kreitman & M Plant 'Sensitive markers of alcoholism' 1981 *Lancet* 1249-51; 'Finding the gene(s) for alcoholism' (1990) 263/15 *JAMA* (Editorial) 2094; FK Goodwin 'Basis of alcohol tolerance found' 1988 *JAMA* 3563.

<sup>28</sup>ME Charness, PS Roger & DA Greenberg 'Medical progress: ethanol and the nervous system' 1989 *New England J of Medicine* 442-454; WD Lerner & HJ Fallon 'The alcohol withdrawal syndrome' 1985 951-952; JJ Llinas 'Dependence on alcohol' in *The Merck Manual* (16ed) 1551-1556; E Buchel 'Alcoholism and the GIT' (1991) 97 815-823; MA Schuckit 'Genetics and the risk for alcoholism' 1985 *JAMA* 1614-2617.

<sup>29</sup>I Gordon, H Shapiro & SD Berson *Forensic medicine: a guide to principles* (3ed) 1988.

<sup>30</sup>E Buchel 'Alcoholism and the GIT' 1991 815-823; MA Schuckit 'Genetics and the risk for alcoholism' 1985 *JAMA* 1614-2617.

The 10 alcoholic subjects were in a detoxication unit, had not imbibed alcohol for two to three weeks, and medication had been withdrawn 6 days before scanning. MRI revealed no significant ventricular enlargement, and no or very slight cortical atrophy. However as seen on PET metabolic activity was decreased in the cortex in the frontal region of the brain of the alcoholics, and whole brain glucose metabolism was reduced on average by 25% as compared with the controls, and compared significantly with memory and motor co-ordination tests in particular. PET would appear to be more sensitive diagnostic procedure for the detection of the early and subtle effects of alcohol abuse, because it measures metabolic change before structural changes in the brain are identifiable by MRI. (Dr Gene-Jack Wang — Brookhaven National Laboratory Upton, NY as reported in Family Practice News.)

### Trauma and alcoholism

The most frequently recurring factor in trauma causation is alcohol. Increases in BAC are accompanied by an exponential increase in the predisposition to injury. The clinical management of the intoxicated injured is often problematic and fraught with medico-legal hazards.<sup>31</sup> Because of the depressant action on those faculties so important for safe driving (as well as for the pedestrian venturing onto pavements and roads) vision, hearing, orientation, concentration, caution, anticipation, restraint, judgement, reliability, responsibility, to mention but a few, are all affected by alcohol, the risk of being involved in a motor vehicle accident as a victim or cause is significantly increased. (See *Figure 4*, page 246.) The seriousness, and extent of long term disability for all parties concerned is also increased.<sup>32</sup> (See *Figure 5*, page 247.)

In a survey of drivers dying within one hour of a motor vehicle accident in which they had been involved it was found that about 80% were under the influence at the time of their death; 70% of adult pedestrians were likewise affected, the majority with BAC in excess of 0.15g%. Of interest was the finding, and understandably so, that the male front seat passenger was generally equally intoxicated.<sup>33</sup> (See *Table H*, page 253.)

In other forms of accidental death amongst adults the risk pattern was no different. By way of example in adult drownings as many as about 60% of victims tested positive for alcohol. The cause of death was not only the consequence of injudicious actions arising out of the effects of alcohol on thought processes, but also due to the consequences of immersion in cold water whilst intoxicated, alcohol induced hypoglycaemia, and/or hypothermia

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<sup>31</sup>WN van Kralingen & others 'Alcohol and the injured driver; the "Podder" project conducted at the Groote Schuur Hospital Trauma Unit'. Report number DPVT/170 CSIR.

<sup>32</sup>LC le Roux & LC Smith 'Violent death and alcoholic intoxication' 1964 *J For Med* 131-141; WE Cooper, TG Schwar & LS Smith *Alcohol, drugs and road traffic* 1979 362.

<sup>33</sup>LS Smith 'Alcohol and drugs as a cause of traffic accidents' 1979 *Robot* 71-80; LC le Roux & LC Smith 'Violent death and alcoholic intoxication' 1964 *J For Med* 131-141.

aggravated by excessive heat loss due to the vasodilatory effect of alcohol on the peripheral vascular system.<sup>34</sup> (See *Table I*, page 254.)

The effects of alcohol may mask the acute consequences of trauma, particularly so in the case of head and abdominal trauma resulting in a failure to identify timeously the underlying pathology, such delays may, and not infrequently materially influence the prognosis with regard not only to survival, but also in so far as the severity of possible later effects of the trauma pathology. In an evaluation of death and permanent disability arising out of delay in referring injured patients to the neurosurgery department, the cause for the delay in 40% of the cases was due to a failure to recognise the extent of the head injury due to the mistaken diagnosis of 'drunkenness'.

#### How much alcohol was consumed?

Alcohol which is soluble in water in all proportions, diffuses, in terms of Fick's Law of Diffusion, from the stomach (20%) and the duodenum and remaining small bowel (about 80%) into the vascular bed of these structures to be distributed by an active blood circulation to the various body tissues in amounts proportional to their water content. The size (mass) of the available pool into which the alcohol may diffuse will be determined not only by the mass of the subject but also by the nature of its constituent parts, in respect of their water content, ie brain tissue, muscle, bone, fat and so forth. (See *Table J*, page 254.) This process of diffusion will continue concurrently with the alcohol metabolic process until equilibrium has been reached in the water content of all the tissues, and maintained thereafter until all the alcohol has been eliminated from the body, represented by the rising and falling tide of alcohol in the blood.

It is on this principle that Widmark formulated that:

- $A = pxc/r$  where  $A$  = the amount of alcohol absorbed into the body tissues at the time of sampling expressed as grammes of alcohol, and therefore the minimum amount consumed  
 $p$  = the mass of the subject in kilogrammes.  
 $c$  = the blood alcohol concentration expressed as g/ 1000g of blood.  
 $r$  = the ratio between the amount of alcohol in the blood and the body as a whole (The value for 'r' falls between 0,5 to 0,9 - the average for women is 0,6 and for men 0,7. The variation in this value for 'r' is due to the sexual differences on an average in fat, bone and muscle proportions in the sexes. In applying this formula to a particular individual a subjective choice of the relevant 'r' factor is to be taken.

With regard to the 'c' value it must be born in mind that the result of the blood test is usually given as grammes alcohol per 100ml blood. This figure must thus be multiplied by 10 as well as taking into account the specific gravity of blood as, about 1,056, to arrive at the true value of 'c'.

In using this calculation to test the veracity of evidence with regard to the

<sup>34</sup>S Davis & LS Smith 'The epidemiology of drowning in Cape Town 1980-1983' 1985 SA Med J 739-742.

amount of alcohol consumed the greatest circumspection must be exercised in applying statistical generalisations to an individual case, making allowances for the established variables co-existing.<sup>35</sup> 6 Appendix

Should the blood have been sampled during the rising tide of alcohol in the blood then the four types of response should be taken into consideration, as at their peaks the BAC may differ by as much as 60%, whereas in the post peak rectilinear decline the difference between the upper and lower limbs of this decline may amount to as much as 30%. Clearly this variation if reflected in the Equation would very materially influence the value of 'A'.

'... by simple calculation it may be possible to determine within fairly wide limits how much alcohol must have been consumed... This of course only to be attempted after absorption has stopped and equilibrium between blood and the tissues has been attained. . . '

By way of example: At a BAC of 0,16g%, the level with the same intake of alcohol per kilogram body mass could result, in a matched individual, in a BAC of 0,10g% and in 75kg man the value for 'A' thus would be somewhere between 72 and 45g of alcohol respectively, should the sample have been drawn on the rising tide of blood alcohol, whereas if sampled during the falling tide the value for 'A' could fall between 36 and 49g of alcohol.<sup>36</sup> (See *Figure 6*, page 248.)

#### **The blood alcohol concentration at the time of the event:**

##### **Back Calculations.<sup>37</sup>**

Out of the very nature of things a blood sample for blood alcohol determinations is often drawn some time after the event at issue. This may be so during life or at autopsy and where the presumptive 2 hour clause is not applicable in terms of the Road Traffic Act it may become necessary to attempt to establish on scientific grounds what the probable BAC was at the material time.

These back calculations in this respect have been, and still are the subject of controversy with regard to the validity of such calculations.<sup>38</sup>

In the absence of evidence as to the pattern of drinking and the intake of food preceding the event any attempt to express an opinion must be with the greatest circumspection.

However if the blood sample is drawn 120 minutes after the last drink then on the substantial balance of probabilities the absorption peak has been reached and elimination has reached the stage of steady linear decline which on

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<sup>35</sup>WE Cooper *Motor law* 1981.

<sup>36</sup>*Ibid.*

<sup>37</sup>*Ibid.*

<sup>38</sup>I Gordon, H Shapiro & SD Berson *Forensic medicine: a guide to principles* (3ed) 1988 403-404.

average falls between 0,01 to 0,02g% per hour.(R)

Formula for back calculation

$$\text{BACC} = \text{BAC1} + (t \times R)$$

where

Blood alcohol at time of event = BACo

Blood alcohol at time of sample = BAC

BAC expressed as g/100ml blood.

t = time in hours from event to sampling time.

R = 0,01 - 0.02 9%

In the case of blood drawn at autopsy the same principles apply. However as the sample is usually taken often many hours after death, it must be established that the sample analysed represents the BAC at the time of death, and does not contain alcohol generated by the fermentation of the body sugar either in the body after death or in the sample before analysis. In the case of gas chromatographic analytical methods if alcohol is produced as aforementioned then the other alcohols, propanol, will be identified. Furthermore if on analysis the sample is shown to contain at least 1% sodium fluoride this is sufficient to prevent fermentation in the sample. Even should alcohol be produced by fermentation in the sample, under optimal conditions in the absence of preservative this would not exceed the third decimal point of a gram per 100ml of blood.

Where death ensues within a short period of the event and particularly so if the stomach contains evidence of a recent meal and even more so if the period of survival was accompanied by severe circulatory embarrassment which would hamper absorption, distribution of any absorbed alcohol, metabolism thereof and elimination, it is probable that the BAC at the time of sampling was materially of the same magnitude at the time of the event.

Of equal importance is the choice of the site from which the blood sample is to be drawn. For practical purposes this is from the vein in the groin, which is least likely to contain alcohol which may diffuse from alcohol in the stomach to vessels lying in proximity to the stomach. Under no circumstances should free lying blood in the chest or abdominal cavity be used as a sample. If the chest cavity is intact as well as the stomach, blood drawn from the right ventricle of the heart it is acceptable as second best.<sup>39</sup> Many pathologists prefer ocular fluid as a sample for alcohol testing after death on the grounds that the eye fluid lies in a relatively isolated position and the least likely site to be influenced by post mortem diffusion of alcohol and the effects of putrefaction.

The disadvantage of ocular fluid is that provision must be made for the conversion to the equivalent BAC, by multiplying the result by the conversion

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<sup>39</sup>VD Plueckhahn & B Ballard 'Diffusion of stomach alcohol and heart blood alcohol concentration at autopsy' 1967 *J for Sci* 463-470.

factor 0,79, which is an arguable value.<sup>40</sup>

### **Alcohol as a cause of death: directly or indirectly**

As death causation needs to be clearly identified in matters both criminal and civil, and particularly so in respect of life, accident and disability claims, it is appropriate to consider in the absence of a statutory provision what should be viewed as death due to other than natural causes.

It has been proposed, as a guideline, that a death caused by the application of force or the effects of any other extrinsic physical or chemical factor, directly or indirectly, with or without complications, or any death which would normally be viewed as a natural death which in the view of a medical practitioner was brought about by an act or omission on the part of any person should be regarded as a death other than due to natural causes, and death occurring whilst under the influence of a local or general anaesthetic or as a consequence thereof, ... (Section 56 Medical Dental and Supplementary Health Professions Act) commonly referred to as 'anaesthetic death', an unfortunate misnomer as such death could equally well be unrelated to the anaesthetic itself. This definition is applicable to the issuing of a Death Certificate by a medical practitioner.

Where death is due to the depression of the vital centres in the brain controlling heart action and respiration by a high BAC this would not be questioned as being death due to other than natural causes, or where vomitus is inhaled during a bout of alcoholism, but many would argue that death due to the chronic effects of alcohol abuse, such as liver cirrhosis, cardiac myopathy or haemorrhage from oesophageal varices should not be viewed as 'natural causes' for purposes of the Inquest Act. The implications arising out of such an interpretation would be far reaching for all parties concerned.

### **Relating event causation to alcoholic intoxication**

Despite overwhelming experimental and statistical evidence with regard to the dangers of alcohol as a causation of motor vehicle accidents and other forms of accident, the medical witness should exercise considerable circumspection before applying statistical generalisations to an individual case, for this decision must rest with the judiciary on the basis of the summation of evidence. A situation may present itself where irrespective of even an adequate response from a sober person the outcome would have been inevitable. It has been argued that the same personality traits which give rise to excessive drinking predispose also to risk behaviour

It can nevertheless be stated that chronic alcoholism predisposes by virtue of its long term effect to increased morbidity and mortality following trauma, as by way of example subdural haemorrhage, and ruptured liver superimposed on hepatic cirrhosis, and also in the case of the neurological consequences of chronic alcoholism resulting in an increase to accident proneness.

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<sup>40</sup>TG Schwar, JD Loubser & JA Olivier *Die ABC van geregtelike geneeskunde* 1984.

### Violation of any criminal law

This 'exclusion' is essentially an issue for legal argument, cognizant of certain medico-legal issues which relate to the validity of the result of the analysis of the sample submitted for alcohol determination, be it blood, ocular fluid or urine drawn from a corpse or living person. In the aforementioned regard consideration must be given to the suitability of the sampling site and the material used to cleanse the surface through which the sample will be drawn the adequacy of sample preservation, intralaboratory specimen identity assurance, laboratory quality control, and overall technological interaction.

Apparent discrepancies between the clinical picture, circumstantial evidence and the relevant result should be diligently pursued before ascribing such discrepancies to biological variation in human response to an alcohol challenge, or the inadequacies of the clinical evaluation. It is of interest to note that in Sweden where a two tier statutory 'drink driving' system is applicable, to wit a BAC of 0,02g% and 0,15g%, and where the burden of proof rests with the prosecution, the pattern of 'defence challenge' is not significantly dis-similar to that encountered in South Africa. (See *Table K*, page 254.) Jones (19) has reported in some depth on the validity of these challenges. In view of the importance in both criminal and civil matters as well as at request of BAC result it would seem advisable that as a matter of routine the subject be offered the choice of a duplicate sample for analysis should at a later state a second analysis be deemed necessary.

### CONCLUSION

Sir William Osler said of tuberculosis — 'a social disease with medical aspects'. The same can be said of alcoholism 'with many medico-legal and economic implications', added as a rider.

A conviction for 'drink and driving' is frequently the first warning of pending addiction, as on a probability basis, due to the inadequacies of law implementation in most parts of the world, the more frequently one drives under the influence of alcohol, the greater is the chance of accident involvement, or identification at road blocks.<sup>41</sup>

In many countries with increasing convictions and the disease model in it's hey-day active steps have been taken and directed to rehabilitation of all convicted drivers and 'drunks' in addition to the legal penalties meted out for alcohol related offences. Such programmes are in widespread use in the USA, Australasia, Scandinavia, Germany, Switzerland, and Holland. In South Africa the occasional 'alcohol schools' of the Department of Welfare scratch the surface of the problem locally.<sup>42</sup>

The exclusion clauses in insurance policies relating to alcohol, although

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<sup>41</sup>DL Viljoen 'The fetal alcohol syndrome' 1991 *CME* 783-790;

<sup>42</sup>'Drinking drivers: the needs for rehabilitation research and research' 1987 *BMJ* (Editorial) 295; 'Sweden lowers blood alcohol limit for drivers' 1990 *BMJ* (Editorial) 1482.

economically justifiable in the interests of the majority of policy holders are not infrequently disastrous for the dependants of the policy holder, on occasions financial consequences of such magnitude to appear to be out of keeping with the default of the deceased. It would be in the interest of all parties, if insurance underwriters insist that these clauses be explained to the intending purchaser and that the latter acknowledge that this has been done by initialling the relevant proviso accordingly.

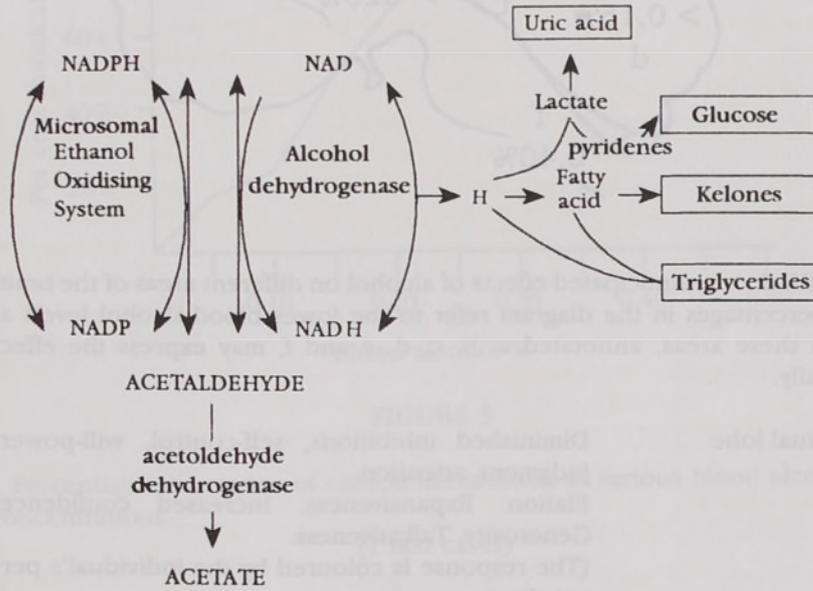
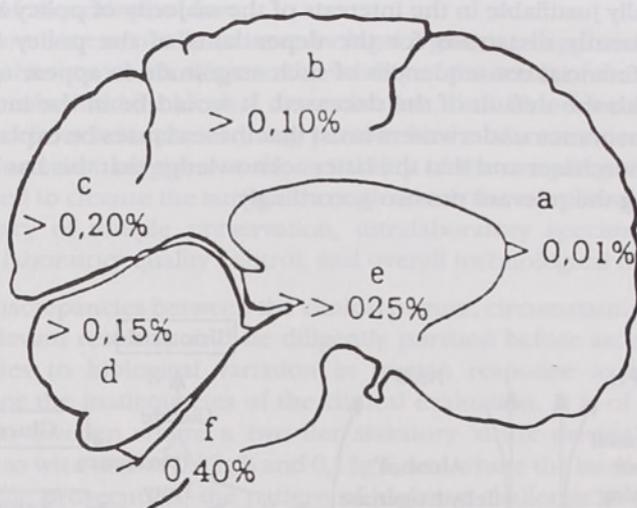


FIGURE 1 METABOLISM OF ALCOHOL

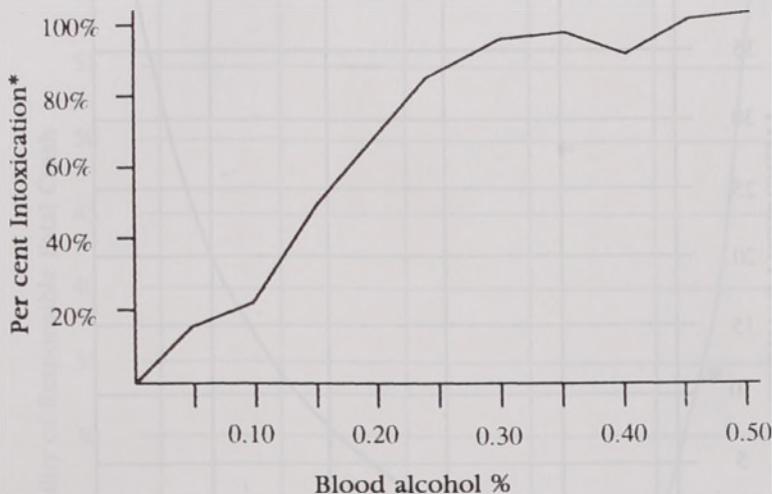


**FIGURE 2** Anticipated effects of alcohol on different areas of the brain  
The percentages in the diagram refer to the lower blood-alcohol levels at which these areas, annotated a, b, c, d, e and f, may express the effect clinically.

- |                                             |                                                                                                                                                                                                                   |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Frontal lobe                             | Diminished inhibitions, self-control, will-power, judgment, attention.<br>Elation. Expansiveness. Increased confidence. Generosity. Talkativeness.<br>(The response is coloured by the individual's personality.) |
| b. Parietal lobe                            | <i>Somaestheto-psychic area</i><br>Distorted sensibilities<br><i>Psycho-motor area</i><br>Apraxia. Agraphia. Ataxia. Tremors. Slurred speech. loss of skills.                                                     |
| c. Occipital lobe                           | <i>Visuo-psychic area</i><br>Disturbance of colour perception, form, dimension, motion, distance and diplopia.                                                                                                    |
| d. Cerebellum                               | Disturbance of equilibrium.                                                                                                                                                                                       |
| e. Diencephalon<br>( <i>thalamic area</i> ) | Apathy. Inertia. Tremors. Sweating. Stupor. Coma.                                                                                                                                                                 |
| f. Medulla                                  | Respiratory depression. Cardio-vascular collapse. Temperature control failure.                                                                                                                                    |

(NB The effects of alcohol on driving skills can be measured by sensitive test systems at even lower levels of blood alcohol.

*Percentage of persons 'under the influence' when blood alcohol between certain limits*



**FIGURE 3**

Percentage occurrence of clinical intoxication at various blood alcohol concentrations

(1 000 cases)

\* Criteria of intoxication

Gross gait abnormality or unable to walk plus two of the following:

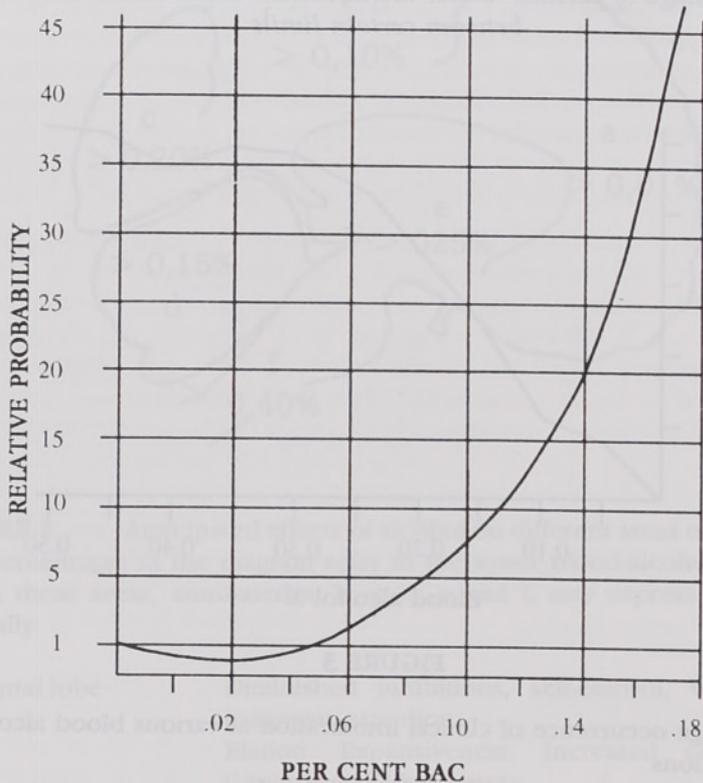
Gross speech abnormality or unable to speak

Flushed face

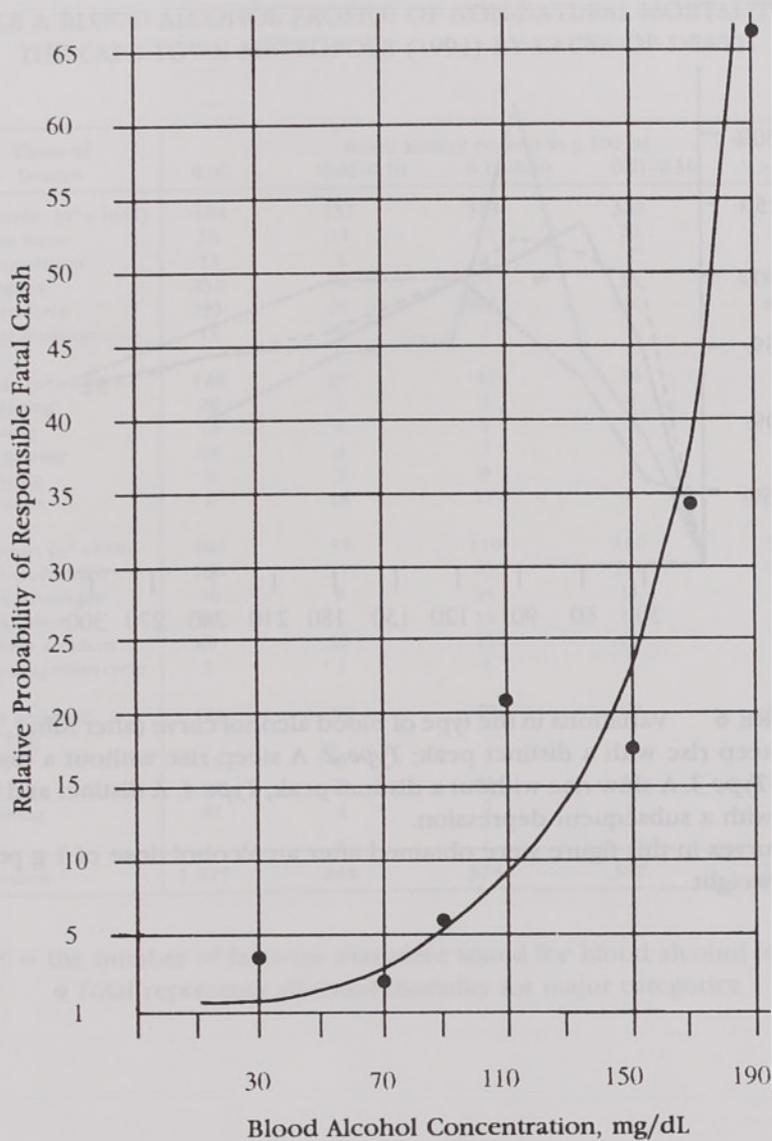
Dilated pupils

Alcoholic odour in breath

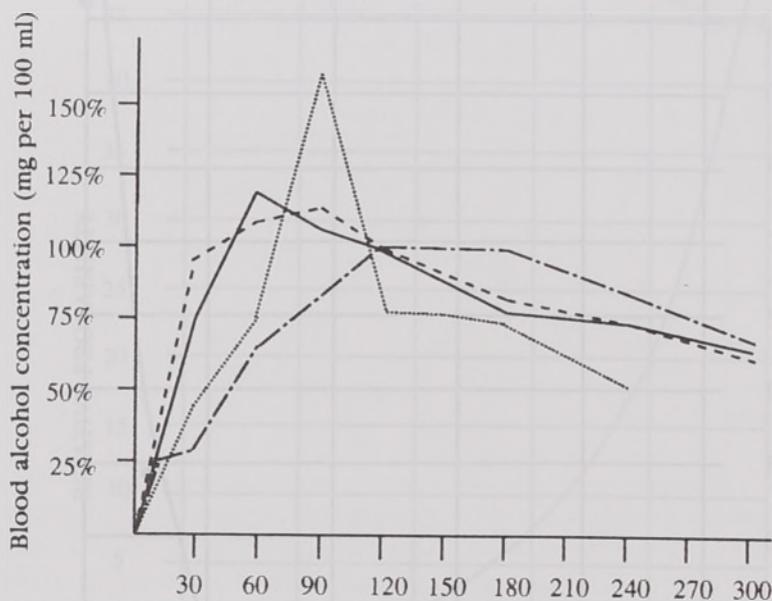
Modified from 'Studies in Alcohol: Diagnosis of Acute Alcoholic Intoxication by Correlation of Clinical and Chemical Findings' by WW Jetter published in *American Journal of Medical Science* (1938) 481.

**FIGURE 4**

*Relative probability of causing an accident*



**FIGURE 5** Relative probability of being responsible for fatal crash rises with rising blood alcohol concentrations.



**FIGURE 6** Variations in the type of blood alcohol curve (after Alha). *Type 1.* A steep rise with a distinct peak; *Type 2.* A steep rise without a distinct peak; *Type 3.* A slow rise without a distinct peak; *Type 4.* A distinct and high peak with a subsequent depression.

The curves in this figure were obtained after an alcohol dose of 1 g per kg body weight.

**TABLE A BLOOD ALCOHOL PROFILE OF NON-NATURAL MORTALITY IN THE CAPE TOWN METROPOLE (1994) BY CAUSE OF DEATH**

Cause of Death $\phi$	Blood alcohol content in g 100 ml				
	0.00	0.01-0.10	0.11-0.20	0.21-0.30	> 0.30
Homicide (n* = 1441)	484	155	353	329	120
Blunt force	55	14	23	20	19
Strangulation	13	1	3	2	1
Firearms	232	56	71	33	8
Sharp force	153	77	246	286	86
Legal intervention	15	1	5	1	2
Suicide (n* = 235)	148	27	42	16	2
Poisoning	20	2	3	0	0
Gassing	14	2	5	2	0
MV gassing	14	2	7	1	1
Hanging	0	7	8	4	1
Firearms	0	14	17	8	0
Transport (n* = 670)	267	55	110	180	58
MVA pedestrian	160	27	63	141	47
MVA passenger	30	8	14	11	2
MVA driver	18	6	15	12	1
Railway accident	49	12	13	13	8
Bicycles/motorcycle	5	1	4	3	0
Other accidents (n* = 328)	128	33	69	67	31
Falls	15	9	5	4	2
Fire	58	13	53	50	11
Drowning	29	4	9	6	6
All causes	1 027	268	574	592	211

n\* = the number of fatalities that were tested for blood alcohol level

$\phi$  Total represents all-cause mortality for major categories

**TABLE B ALCOHOL / MEDICINE INTERACTION EXAMPLES**

amphetamines	griseofulvine	POTENTIATION
antihistaminics	methyldopa	
antipsychotics	monoamine oxidase inhibitors	
aspirin	hypoglycaemic agents	
barbiturates	tricyclic antidepressants	
benzodiazepines		
bromocriptine		
cimetidine		ELEVATED BAC
haloperidol		
aspirin (?)		

**TABLE C ALCOHOL CONSUMPTION (RSA 1990)**

Group	Males	Females
	%	%
Whites	89	77
Blacks	80	60
Coloureds	59	27
Indians	49	8

The estimated % of persons in various groups who consume alcohol. (Adults).

TABLE D

**TABLE D ALCOHOL AND THE INJURED DRIVER: THE PODDER PROJECT CONDUCTED AT THE GROOTE SCHUUR TRAUMA UNIT**

Driver's Appearance	No. of drivers	BAC (in g/100ml)			Prediction errors	
		0	0,01-0,07	0,08-1,00	Number	%
<b>NOT APP. DRUNK</b>						
Conscious	208	165	15	28	28	13,5
Unconscious	7	5	0	2	2	28,6
TOTAL	215	170	15	30	30	14,0
<b>APP. DRUNK</b>						
Conscious	57	4	7	46	11	19,3
Unconscious	3	0	1	2	1	33,3
TOTAL	60	4	8	48	12	20,0
<b>OVERALL</b>						
Conscious	265	169	22	74	39	14,7
Unconscious	10	5	1	4	3	30,0
TOTAL	275	174	23	78	42	15,3

WN van Kralingen, S Whittaker, J van der Spuy, LS Smith, JM Stokol & PM Haddow 'Road and Transport Technology' CSIR Report DPVT/170 1991.

**TABLE E PERCENTAGE OF SUBJECTS 'UNDER THE INFLUENCE' (At various stages of absorption and elimination)**

BAC	Rising Tide		1-1,5 hrs after BAC peak		2-2,5 hrs after BAC peak	
	No	%	No	%	No	%
0,05	80	50	0	0	4	0
0,08	83	57	18	5	28	0
0,10	49	66	23	4	24	4
0,12	52	77	22	36	19	21
0,14	42	69	21	38	20	15
0,16	33	91	9	73	6	6
0,18	13	85	3	66	4	50
0,20	7	100	5	100	0	0
0,22	4	100	0	0	0	0

(Blood alcohol and inebriation in Finnish men: (1951) 7 *AR ALba* 183).



TABLE G

g%	Per cent 'Under the Influence'	
	Widmark (± 2 000 cases)	Andresen (± 2 000 cases)
0	-	2,9
0,001-0,02	0	33,3
0,021-0,04	0	18,5
0,041-0,06	0	61,2
0,061-0,08	15	67,8
0,081-0,10	29	76,3
0,101-0,12	38	73,4
0,121-0,14	54	82,9
0,141-0,16	71	90,3
0,161-0,18	84	96,1
0,181-0,20	88	94,8
0,201-0,22	91	98,3
0,221-0,24	95	100,0
0,241-0,26	95	95,8
0,261-0,28	98	100,0
0,281-0,30	96	100,0
0,301-0,32	100	100,0

Modified from (1951) 78 *Alha* quoting Jungmichel's evaluation of Widmark's Study (Swedish) and Andresen's study (Danish).

TABLE H BLOOD ALCOHOL CONCENTRATION: DRIVER DEATHS WITHIN ONE HOUR OF THE ACCIDENT (GREATER CAPE TOWN) 1980

BAC	No	%
Nil	7 (20)	17,1 (20)
<0,05	3 (3)	82,9 (80)
" 0,10	7 (6)	
" 0,15	13 (12)	
" 0,20	4 (21)	
" 0,25	7 (19)	
>0,25	0 (19)	
Total	41 (100)	100 (100)

Figures in ( ) 1974-1978

**TABLE I BLOOD-ALCOHOL CONCENTRATIONS IN VICTIMS OF DROWNING, CAPE TOWN 1980-1983**

Blood-alcohol content (g/dl)	No of victims	%
Nil	93	35,4
<0,05	22	
<0,10	15	
<0,15	14	
<0,20	26	
<0,25	36	64,6
<0,30	38	
<0,35	11	
<0,35	8	
Total	263	100

**TABLE J BODY WATER CONTENT  
% Total Mass**

	Male	Female
Body mass	± 60	± 50
Extracellular	15	15
Intracellular	45	40
Muscle	74	
Brain	93	
Fat	50	
Bone	31	
Blood	80	

**TABLE K TOP TEN DEFENCE CHALLENGES AMONG INDIVIDUALS APPREHENDED FOR DRIVING WHILE UNDER THE INFLUENCE OF ALCOHOL IN SWEDEN**

Rank	Brief description of the defence challenge
1	Drinking after the offence; the hip flask ploy
2	Laced drinks
3	Inhalation of ethanol vapours from the work environment
4	Pathological condition or trauma
5	Use of skin antiseptics containing ethanol
6	Alleged mix-up of blood specimens
7	Post-sampling formation of alcohols
8	Drug-alcohol interactions
9	Consumption of elixirs or health tonics containing alcohol
10	Infusion of blood or other liquids during surgical emergency treatment