EFFECTIVE NHS CONTRIBUTIONS TO VIOLENCE PREVENTION

THE CARDIFF MODEL

Prepared for
Rt Hon Alan Johnson MP
Member of Parliament for
Kingston Upon Hull West and Hessle

CONTENTS

THE ROLE OF EMERGENCY DEPARTMENTS IN COMMUNITY VIOLENCE PREVENTION

This is an update of a paper commissioned by the Department of Health in 2004.

Summary

Emergency Departments (EDs) can contribute distinctively and effectively to violence prevention by working with Crime and Disorder Reduction Partnerships (CDRPs) and by sharing, electronically wherever possible, simple anonymised data about precise location of violence, weapon use, assailants and day/time of violence. These data, and the contributions of consultants in CDRP meetings, enhance effectiveness of targeted policing significantly, reduce licensed premises and street violence, and reduce overall A&E violence related attendances - in Cardiff, by 40% since 2002. The city has moved from mid table to safest city it its Home Office family of 15 similar cities now, a position which has been maintained for over three years. In the recent *Reform* study, Cardiff was 51st out of 55 towns and cities with more than 100,000 population in terms of the incidence of all assault and robbery. Evaluations have been published in the Emergency Medicine Journal and the Journal of the Royal College of Surgeons of Edinburgh.

This protocol for Emergency Medicine involvement in community violence prevention sets out the reasons for contributing, how contributions can be made, what contributions have been found to be effective, who should contribute and when contributions are best made. Misconceptions and barriers to working with local violence reduction agencies are listed, together with ways of overcoming them which are consistent with ethical guidance to doctors and data protection legislation.

Reasons for Emergency Medicine involvement in Community Violence Prevention

- Large numbers of violent offences which result in ED treatment are not detected by the police.[1,2]
- Information about location and time of assaults, which can easily be collected in EDs can help police and local authorities target their resources much more effectively.[3,4]
- ED professionals, particularly senior doctors, can be powerful and effective advocates for community safety particularly when they work in local crime prevention partnerships.[3,4]
- ED health professionals act from the patient/victim perspective: most crime prevention activity is orientated towards offenders/offending.
- Burdens on EDs can be reduced, particularly late at night at the weekend when services are stretched and alcohol-related disorder is commonplace, including in the ED itself.
- Involvement can lead to improvements in local transport services, pedestrian safety and alcohol licensing all of which are important in violence prevention.[3,4]
- Involvement can help other agencies to realise the seriousness of violence from a health standpoint, particularly the numbers and seriousness of injury sustained.
- EDs are the only sources of information about serial (repeat) injury: a recognised precursor to homicide in the home and elsewhere.
- This approach can identify trends in weapon use: the use of glasses and bottles as weapons was first recognised not by police but by ED services.[5,6]
- Even very serious violence, knife and gun crime, may not be reported to the police, for example in drug – related gang crime.[7]
- Legislation includes the NHS as a statutory partner in local crime prevention (e.g. Crime and Disorder Act 1998): emergency medicine is able to contribute a great deal in this context.
- Data sharing provides a new objective measure of community violence which helps the public, the police, local government and the Home Office to understand the true size of the problem.[8,9]
- ED staff can facilitate increased reporting of violence to the police by those injured who are not in a position to report.[10]

- ED doctors have an ethical responsibility, in the public interest, to report serious violence if the patient or other people are at continued risk,[11] for example with regard to knife and gun crime, with regard to people who have been injured previously at the hands of the same person and with regard to locations of violence such as particular nightclubs.
- ED patients who have been injured in violence support routine questioning about the circumstances of injury, police reporting and whether they need help to report or to prevent future harm.[13]

How can Emergency Medicine contribute to community violence prevention?

- By leading EM efforts to contribute to local violence prevention.
- By ensuring the collection of information from assault patients with regard to location, time and other circumstances of assault.[3,4]
- By sharing anonymised information promptly with the police and other local crime reduction partners.[3,4]
- By working with public health and local crime reduction/community safety partnerships to measure community violence.[8]
- By identifying serial (repeat) attenders and referring them to agencies, for example to womens' safety units, who can intervene to reduce the chances of further harm.
- By providing EM representation at consultant level to local crime reduction/community safety partnerships.
- By auditing hotspot locations for violence such as particular bars and nightclubs.
- By providing local clinical experts for drinks license hearings in local courts, to make sure that licensing takes account of safety/injury risk.
- By being committed to decreasing community violence as well as treating the injured.
- By initiating and participating in local safety campaigns, working with local media.
- By providing facilities and encouragement – leaflets and opportunities for patients to report to the police without interference, in the safe haven of an ED.[10]

Who in Emergency Medicine and NHS Hospital Trusts can contribute to community violence prevention?

- Receptionists, who have been identified as in the best position to record, electronically wherever possible the necessary information.[12] This obviates the need for busy doctors and nurses to carry out this task.
- Managers and IT staff, who can anonymise information, adjust local software and share data electronically with analysts working in local crime prevention partnerships.
- Nurses, who can supplement information collected by clerical staff, enquire routinely about the circumstances of injury, and contribute to secondary prevention, for example with regard to alcohol brief interventions.
- Consultants, who can contribute to local prevention as persuasive advocates for community safety acting as ambassadors in this regard for their hospital Trusts. ED doctors can be persuasive witnesses in alcohol license hearings and can contribute effectively to conferences with other agencies.

When can Emergency Medicine services contribute to community violence prevention?

- During contacts with assault patients.
- At attendance of every serial (repeat) assault patient/victim. Serial attendance should prompt enquiries about police reporting, as well as referral to other agencies. A further example is when, during the night, several injured people attend from the same night club, when this fact should be promptly reported to the police.
- When those who have been injured in very serious violence attend: when patients are brought in unconscious or have been injured in gun or knife crime when the police should be informed promptly whether or not the patient's consent can been obtained.
- Frequency of information sharing with crime reduction partnerships should be agreed locally.

What can Emergency Medicine contribute to the prevention of community violence?

- Anonymised data/intelligence, with regard to violence location, time, date, weapon, and assailants.
- Advocates for local prevention and safety: particularly consultants contributing to multiagency meetings.
- Expert witnesses and witnesses of fact in court hearings.
- Safe havens for patients to report to the police and explain to them what has happened.
- Partners in local crime prevention: crime reduction and community safety partnerships want to work with EDs.
- Evidence based attitudes. The evidence based culture is more advanced in medicine than it is in crime prevention: ED doctors can bring greater objectivity to violence prevention effort.
- Commitment to safety in the town/city served by their ED.

Misconceptions and barriers to ED contributions to community violence prevention

- **Patient confidentiality.**
  There are some misconceptions about confidentiality: although it is, of course, important to respect the confidential nature of personal information, data protection and crime prevention legislation and General Medical Council guidance makes specific provision for data sharing to detect, investigate and prevent community violence, of which all violence which results in A&E treatment can be considered from a lay perspective to be a serious example. Indeed, Hospital Trusts may be in breach of data protection legislation by, for example, not instituting processes through which doctors and nurses can know when patients are repeat attenders after injury in violence. Responsibility with regard to data, a key principle underpinning data protection legislation, means identifying repeat attenders, and responsible sharing of data with agencies able to increase community safety. It is important to ensure that patients have access to means of reporting violence to the police whilst in the ED. In the context of recent

murder enquiries, public services have been criticised for not sharing data when, potentially, lives and serious injury may have been prevented by so doing.

With regard to the most serious cases, the GMC has advised that all firearm injuries should be reported promptly with the patient's knowledge but, if necessary, without their consent.

- **A blinkered attitude to injury which focuses only on treatment.**
  Prevention and wider issues of justice and safety are also important. Involvement in community prevention has in the past even been criticised, wrongly, as 'unacceptable medical paternalism'. Hospital Trusts and EDs are of course, central in local communities.

- **Unreasonable demands for evidence by police officers.**
  Some antagonism on the part of ED staff towards police officers has been generated as a result of unreasonable demands for evidence. Police approaches should take account of the rights of the injured and responses by ED personnel should, taking issues of confidentiality into consideration, take account of the need to detect and prevent serious violence so that further violence can be prevented and offenders brought to justice.

- **Over-regulation.**
  In the past, guidelines have been published which recommend disclosure of information by senior ED doctors to senior police officers. In practice, most violence occurs late at night and at weekends when senior staff in both services may not be present. Appropriate disclosure of information about the circumstances of violence should take place promptly, with regard for example to gun shot and knife wounds and all ED doctors should be ready to contact the police when appropriate. In the past, concern about the consequences of a formal approach has led junior doctors to provide police informally with tip offs in relation for example to drug related offences.

- **Logistic barriers to collection of evidence**. These include lack of appropriate software in ED reception and elsewhere, and lack of electronic links with crime analysts working in crime reduction partnerships. These barriers can be overcome by receptionist training, simple adjustments to software by Trust IT staff, and establishment of formal links between ED consultants and local crime reduction partnerships.

- **Funding.** Relevant data collection, IT support and links with crime reduction partnerships can be achieved at no extra cost to local EDs.[10] Unjustified concerns about funding can get in the way of responsible practice. Solutions are however available from local crime reduction partnerships who are all funded to facilitate data sharing.

- **Time constraints.** Evaluations indicate that whilst doctors and nurses may be too busy to collect information about the circumstances of violence, reception staff have opportunities during waiting room waits and also have access to appropriate IT systems. Data collection by reception staff obviates the need for clinical staff to collect information, but responsible clinical care should still include enquiry about cause of injury, police reporting and finding out whether one injury may be part of a series of attendances after injury at the hands of the same attacker.

- **Lack of relevant legislation.** This problem has been largely overcome with the 1998 Crime and Disorder Act, the 2002 Police Reform Act, the 2006 Violent Crime Reduction Act and Data Protection and Human Rights Legislation, which facilitate responsible data sharing in the context of the prevention, detection and investigation of community violence. Government departments have also published guidance on data protection.[15]

References

1 Shepherd JP. Criminal deterrence as a public health strategy. Lancet 2001;358:1717-1722.

2 Shepherd JP. Using injury data for violence prevention. BMJ 2000;321:1481-1482.

3 Warburton A, Shepherd JP. Development, utilisation and importance of ED-derived assault data in violence management. Emerg Med J 2004;21:473-477.

4 Warburton A, Shepherd JP. Tackling alcohol related violence in city centres: effect of emergency medicine and police intervention. Emergency Medicine Journal 2006;23:1217.

5 Shepherd JP, Shapland M, Pearce NX. Pattern, severity and aetiology of injuries in victims of assault. J Roy Soc Med 1990;83:75-78.

6 Hocking MA. Assaults in southeast London. J Roy Soc Med 1989;82:281-284.

7 Clarkson C, Cretney A, Davis G, Shepherd JP. Assaults: the relationship between seriousness, criminalisation and punishment. Crim Law Rev 1994;Jan:2-21.

8 Sivarajasingam V, Shepherd JP, Matthews K, Jones S. Trends in violence in England and Wales 1995-2000: an accident and emergency perspective. J Public Health Medicine 2002;24:219-226.

9 Burrell I. Biggest increase in violent injuries found among girls. Independent 7 November 2002.

10 Home Office Cardiff Violence Prevention Group: crime – let's bring it down. Home Office 2000.

11 General Medical Council. Ethical guidance to doctors. London. GMC 2000.

12 Goodwin V, Shepherd JP. Evaluation of a questionnaire to facilitate the contribution of A&E departments to Crime and Disorder Act local crime audits. J Accid Emerg Med 2000;17:196-198.

13 Howe A, Crilly M, Fairhurst R. Acceptability of asking patients about violence in accident and emergency. Emerg Med J 2002;19:138-40.

14 Shepherd JP. Emergency medicine and police collaboration to prevent community violence. Ann Emerg Med 2001;38:430-437.

15 Douglas N, Lilley S-J, Kooper L, Diamond A. Safety and justice: sharing personal information in the context of domestic violence – an overview. London. Home Office 2004.

THE CARDIFF MODEL FOR VIOLENCE PREVENTION – A BRIEF SPECIFICATION

Objective: To prevent violence and to reduce burdens on emergency services.

Essential ingredients:

- Data collection system in EDs – preferably electronic.
- Hospital Trust IT capacity to anonymise and share ED data.
- Crime analyst in Crime and Disorder Reduction Partnership (CDRP) with the skills to integrate and summarise information about violence from ED and police sources.
- At least one NHS ED consultant who is committed to injury prevention, and prepared to lead ED implementation and attend CDRP task group meetings.
- Prioritisation of violence as a public health issue by the local public health service.
- CDRP task group dedicated to continuous scientific violence prevention which includes senior police, local authority and ED practitioners.

Data delivery chain:

Step One	24 hour electronic data collection by ED clerical staff when patients first attend.
Step Two	Monthly anonymisation and sharing of data by Hospital Trust IT staff with CDRP analyst.
Step Three	Monthly combination of police and ED data by CDRP analyst.
Step Four	Summary (less than ten pages) of violence times, locations and weapons by CDRP analyst.
Step Five	Continuous implementation and updating of prevention action plan by CDRP violence task group.
Step Six	Continuous tracking of violence trends – overall trends and trends in violence hotspots.

Supplementary violence management:
Licensed premises traffic light system.

Menu of effective policing, situational and environmental interventions. For example:
- Targeted street patrols, CCTV, redeployment of police from suburbs into city centre at night.
- Plastic glassware, fast food outlet relocation.
- Pedestrianisation of entertainment streets, continuous night time street cleaning (fear of crime measure).

Performance measures:
- ED data.
- Police iQuanta city woundings data.

Patient/victim interventions:
- Brief alcohol interventions in hospital trauma and maxillofacial out-patient clinics – delivered by wound care nurses at the time of suture/plaster removal.
- Support and referral for multi-agency risk assessment of people injured in domestic violence.

References:
Shepherd JP. Preventing violence – caring for victims. Surgeon 2007;5:114-121.
Robinson AL. Reducing repeat victimisation among high risk victims of domestic violence. Violence Against Women 2006;12:761-788.

IMPLEMENTATION OF ED– BASED VIOLENCE PREVENTION: THE CARDIFF MODEL

Scotland: In Scotland, recognising the benefits of managing violence as a public health as well as a criminal justice issue, and recognising the effectiveness of the innovative Emergency Department (ED) initiative which is key to delivering prevention, the Scottish Government Deputy First Minister and Cabinet Secretary for Health and Well-being, Nicola Sturgeon MSP, is leading this. Working with a senior medical advisor in the Scottish Government, Dr Padmini Mishra and the Deputy CMO, Peter Donnelly, this initiative is being rolled out throughout the Lanarkshire Health Board, at the Glasgow Royal Infirmary, Edinburgh Royal Infirmary and in Fife and Aberdeen. Evidence of effectiveness of this initiative is influencing both strategic and tactical thinking and is seen as key to understanding violence and driving prevention in the context that only about 25% of violence which leads to hospital treatment appears in police records, including the prevention of knife and gang crime. Injury data is, following the Cardiff evaluation, being used to develop a new performance measure. The Scottish Government is developing national electronic ED data collection facilitated by the ED Information System (EDIS). Overall, in the words of Karyn McCluskey, Strathclyde Police and the Violent Crime Unit (VCU) for Scotland Principal Crime Analyst, referring to information derived from A&E, 'We could not do without it'.

Wales: Reflecting convincing evidence of the benefits, the Cardiff Model has been adopted by Welsh Assembly Government and leadership is being provided by the Director of Community Safety for Wales, Gillian Baranski, who established a strategic Crime-Health Group in 2005 which is working with EDs in Wales in the context of the Wales Emergency Department Federation (WEdFed). Implementation is being taken forward in Merthyr Tydfil, Bridgend, Neath Port Talbot and Camarthen. The National Public Health Service for Wales, which has published a framework for community safety partnerships and local health boards, 'Community violence and the NHS' (NPHS ISBN: 0 9547446 6 7) has, through road shows, in Wrexham and Cardiff disseminated information throughout Wales. In Cardiff, after 10 years of refinement of the initiative, the principal active ingredients remain the unique anonymised NHS data about violence location, time and weapon, participation of ED consultants in crime reduction partnership meetings and the evidence-based NHS culture. Spin off innovations include the first UK university police school (the Universities' Police Science Institute), opened by the Prince of Wales in June 2007, the widespread use of plastic bottles and glasses in Cardiff – a principal weapon type throughout the UK – and the provision of confidential reception facilities in EDs making for a more personal emergency service.

EVIDENCE OF EFFECTIVENESS

The charts below demonstrate reductions in violence - related ED attendances in Cardiff for both men and women, a sustained reduction in woundings in Cardiff compared with the other cities in the Home Office Cardiff family, the fall of Cardiff to the bottom of the woundings league table and Cardiff's current (May 2007) position for woundings and all violent crime
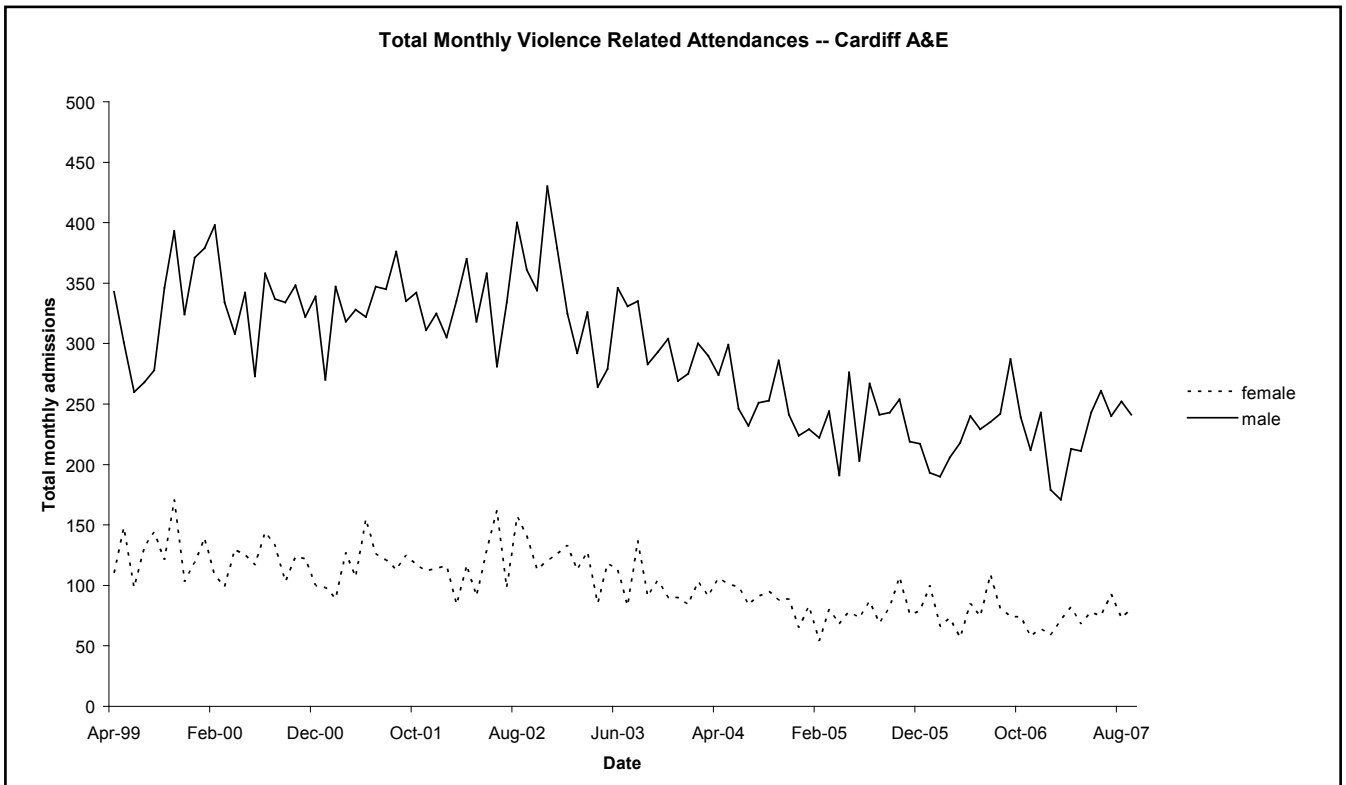
Above: *Chart showing the number of violence related A&E attendances Cardiff - 1999 to 2007*
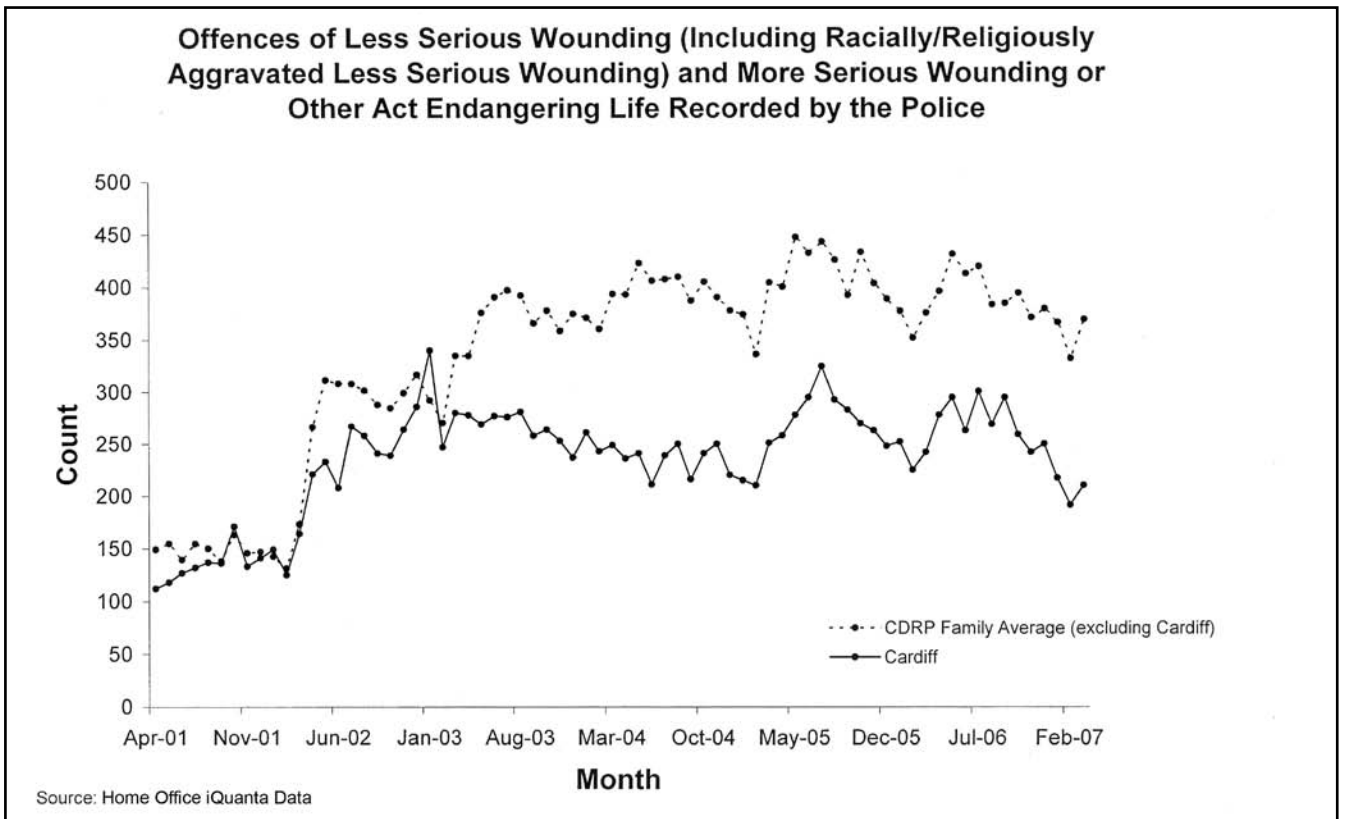
Above: *Chart showing trends in woundings recorded by the Police in Cardiff and in the other "most similar" cities in it's Home Office family*

Position of Cardiff in Home Office Family of "Most Similar" Cities - Woundings (iQuanta Data)

Source: Cardiff Violence Research Group
Note: Rank 1 equals safest city in family
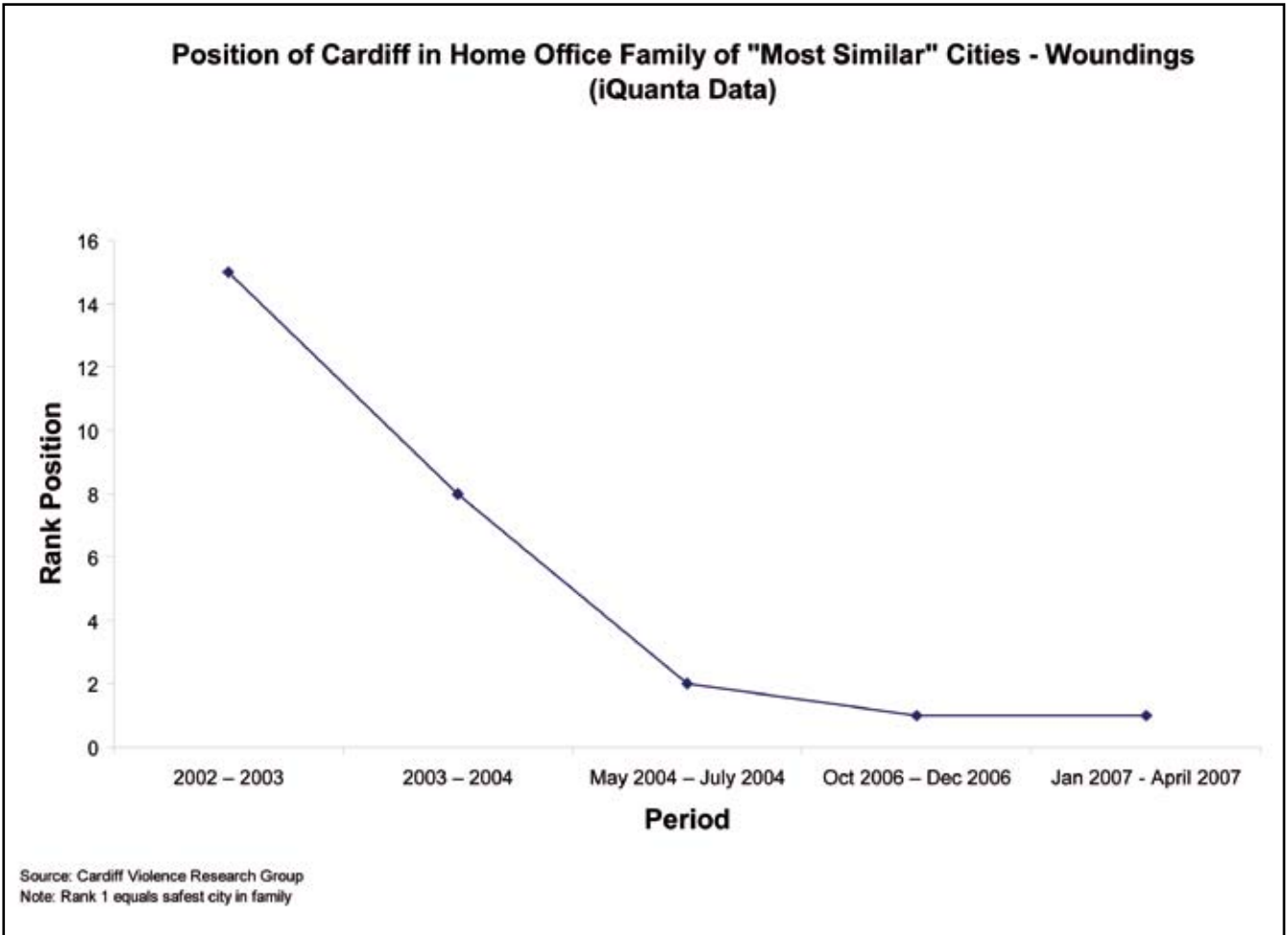
Above: *Chart showing progress of Cardiff to safest city in it's Home Office family*
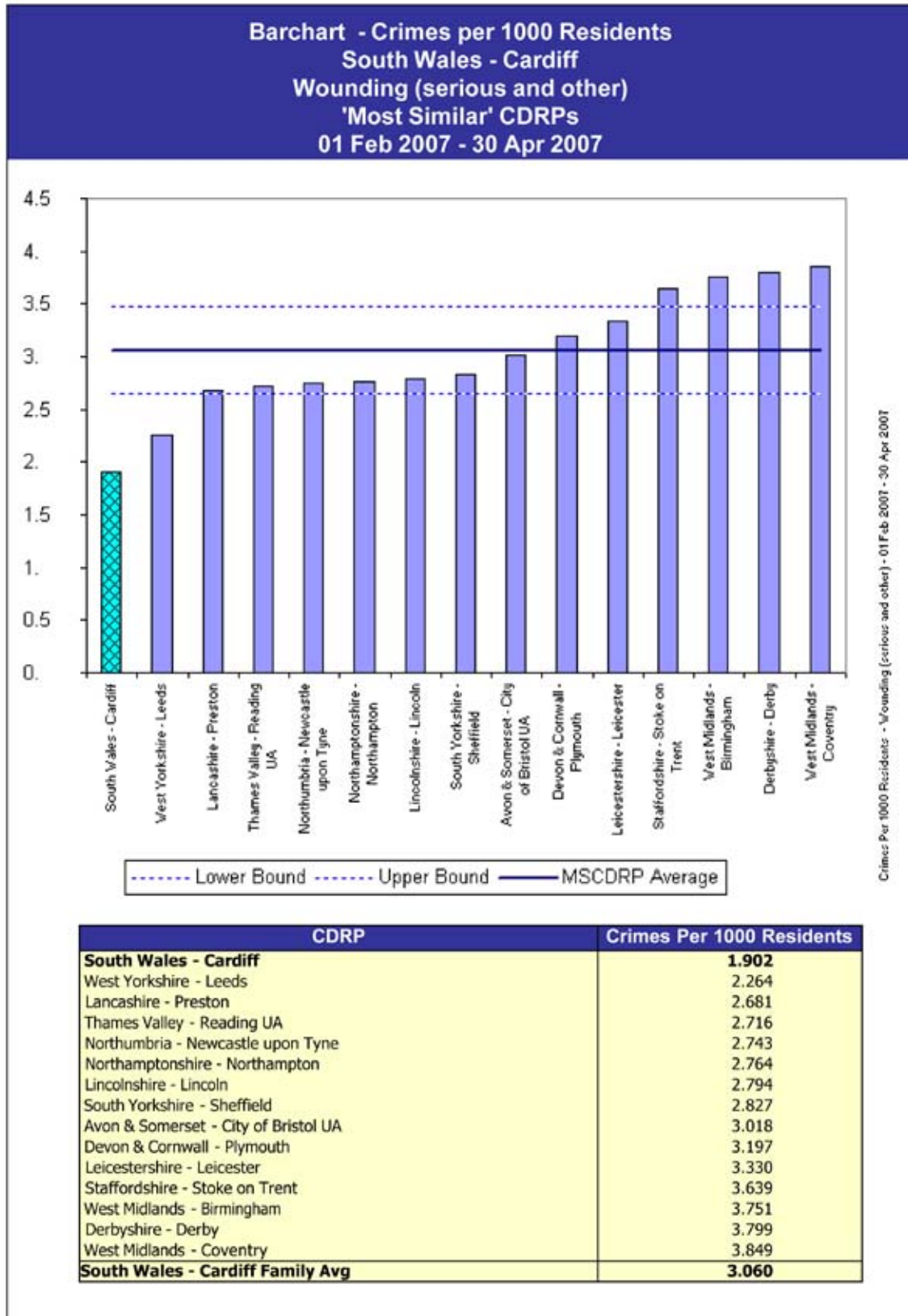
Barchart - Crimes per 1000 Residents
South Wales - Cardiff
Wounding (serious and other)
'Most Similar' CDRPs
01 Feb 2007 - 30 Apr 2007

------ Lower Bound ------- Upper Bound ——— MSCDRP Average

CDRP	Crimes Per 1000 Residents
South Wales - Cardiff	**1.902**
West Yorkshire - Leeds	2.264
Lancashire - Preston	2.681
Thames Valley - Reading UA	2.716
Northumbria - Newcastle upon Tyne	2.743
Northamptonshire - Northampton	2.764
Lincolnshire - Lincoln	2.794
South Yorkshire - Sheffield	2.827
Avon & Somerset - City of Bristol UA	3.018
Devon & Cornwall - Plymouth	3.197
Leicestershire - Leicester	3.330
Staffordshire - Stoke on Trent	3.639
West Midlands - Birmingham	3.751
Derbyshire - Derby	3.799
West Midlands - Coventry	3.849
South Wales - Cardiff Family Avg	**3.060**

Barchart - Crimes per 1000 Residents
South Wales - Cardiff
Violent Crime
'Most Similar' CDRPs
01 Feb 2007 - 30 Apr 2007

CDRP	Crimes Per 1000 Residents
South Wales - Cardiff	**4.739**
West Yorkshire - Leeds	5.381
Northumbria - Newcastle upon Tyne	5.702
South Yorkshire - Sheffield	5.865
Devon & Cornwall - Plymouth	6.220
Lancashire - Preston	6.345
Derbyshire - Derby	6.481
Northamptonshire - Northampton	6.632
Staffordshire - Stoke on Trent	7.105
Avon & Somerset - City of Bristol UA	7.141
Lincolnshire - Lincoln	7.323
West Midlands - Birmingham	7.543
West Midlands - Coventry	7.714
Thames Valley - Reading UA	9.381
Leicestershire - Leicester	9.430
South Wales - Cardiff Family Avg	**6.726**

King James IV Lecture

J. Shepherd
King James IV Professor of Surgery,
Royal College of Surgeons of Edinburgh

Correspondence to:
Professor Jonathan Shepherd,
Department of Oral and
Maxillofacial Surgery,
School of Dentistry,
Cardiff University, Heath Park,
Cardiff CF14 4XY, UK
E-mail: shepherdjp@cardiff.ac.uk
Web: www.cardiff.ac.uk/vrg

Preventing violence – caring for victims

Part of the great tradition of surgery, exemplified by the Royal College precept, 'From Here Health', is that surgeons are committed to prevention as well as cure. King James IV and his able contemporary in China, where this lecture was delivered, Emperor Hongzhi, would have approved of it. This tradition has, perhaps, been neglected since the emergence of public health as a medical specialty. However, opportunities and reasons for surgeons to contribute to prevention have never been greater. Community violence prevention – increasing public safety in the towns and cities in which surgeons work – is an example. Primary prevention of injury achieved by collecting and sharing unique information about weapons and the locations of assault, secondary prevention achieved by combining wound care with motivational interviewing to reduce alcohol misuse, and tertiary prevention achieved by early referral to mental health professionals for treatment of post-traumatic stress, have been integrated into a new care pathway which combines prevention with surgical care. Individuals and communities would benefit substantially if every surgical specialty incorporated prevention – a professionally highly-rewarding activity – into its training curriculum.
Keywords: prevention, injury, surgery, multi-agency, alcohol misuse

INTRODUCTION

Prevention of illness and injury has long been of interest to surgeons. More than any other health professionals, perhaps, surgeons understand the burdens and risks of treatment and that prevention is as important as cure. Furthermore, commitment to prevention is entirely consistent with the precept, 'From Here, Health' which is at the heart of the Royal College of Surgeons of Edinburgh's (RCSEd) quincentenary celebrations.[1] Rightly of course, specialisation in medicine and surgery has led to the development of epidemiology and public health as distinct disciplines with their own training programmes and professional regulation. At the same time, surgeons have made, and can continue to make, enormous contributions to prevention, both as part of their everyday practice and also, from time to time, by moving from surgery into public health. For example, Dennis Burkitt, a distinguished fellow of the RCSEd, while he was a lecturer in surgery at the Makerere University College in Kampala, Uganda, through assiduous collection of case records, assembled the evidence which links his eponymous lymphoma with an infective agent later identified as Epstein-Barr virus.[2] Not content with this, he distinguished himself in an entirely different field of public health through his studies of the epidemiology of cancer of the colon and rectum, linking dietary factors to gastro-intestinal neoplasia.[3]

Sir Kenneth Calman and Sir David Carter, distinguished Chief Medical Officers for Scotland, are more recent examples of distinguished surgeons who have made major contributions to prevention, and there are many others in general surgery, dental surgery, ophthalmology, dermatologic surgery and in other specialties of surgery who have also contributed.

VIOLENCE AND SURGERY

Since the beginning of recorded medical history, surgery and the development of surgery, have been closely linked with injuries caused in conflicts. Indeed, surgery owes a great deal to its pioneers who were surgeons in wartime. Quantum leaps in surgical understanding and the organisation of trauma services come from, for example, the work of Baron Larrey, Napoleon's surgeon general serving the Grande Armeé.[4] War surgery has increased knowledge and improved outcomes of the surgery of burns and limb injuries and has developed understanding about the optimum time to intervene as well as the best way trauma services should be organised and the principles of triage applied. Not surprisingly, war surgery including the surgery of firearm

and other wounds sustained in civil unrest; Northern Ireland, for example, has long been a draw for surgeons wishing to improve their skills.

Interpersonal violence, defined by the World Health Organisation as violence between individuals or small groups of individuals, is an insidious and frequently deadly social problem which includes child maltreatment, youth violence, intimate partner violence, sexual violence and elder abuse.[5] It takes place in the home, on the streets and in other public settings, in the workplace and in institutions such as schools, hospitals and residential care facilities. The direct and indirect financial costs of this violence are enormous, quite apart from the social and human costs that cause untold damage to the economic and social fabric of communities and entire countries. The World Health Organisation (WHO) 2002 'World Report on Violence and Health', prompted by research demonstrating the substantial physical and psychological impact of violence, has established violence as a public health issue globally. It has been calculated that the worldwide age-adjusted death rate for violence in 2000 was 28.8 per 100,000 population. However, death rates from violence vary according to country income levels. In 2000, the rate of violent death in low to middle income countries was 32 per 100,000 population, more than twice the rate in high income countries (14.4 per 100,000 population). There are also considerable regional differences in death rates from violence. In Africa and the USA, homicide rates are nearly three times greater than suicide rates whereas, in Europe and South East Asia, suicide rates are more than double homicide rates. Within regions there are also large differences between countries. For example, the 1994 homicide rate among males in Columbia was 147 per 100,000 while the corresponding rates in Cuba and Mexico were 12.6 and 32 per 100,000, respectively. However, in all parts of the world, death represents the tip of the iceberg as far as violence is concerned. Importantly, information about crime from criminal justice systems – the police and courts for example – is very much less complete than public health estimates of fatal and non-fatal injury.[5]

The anatomical distribution of injuries sustained in violence also varies from country to country and injury severity depends on weapon use, particularly the use of firearms. However, in terms of frequency, the oro-facial region is most affected, reflecting the commonplace use of fists and blunt weapons in violence. In the UK, for example, the majority of fractures, lacerations and haematomas caused by violence are facial.[6]

MEASURING VIOLENCE

Traditionally, measuring violence has been the remit of crime statisticians using police records and information obtained from national crime surveys – usually of large random samples of householders surveyed in the British Crime Survey for example, which is now an annual survey of 40,000 households in England and Wales. However, such crime surveys do not provide measures at community, town or city levels because of problems with sample size leaving, until recently, police records as the only available measure. Furthermore, crime surveys usually do not include violence towards children.[7]

A major problem with police records however, is their incompleteness. International and national crime surveys in Sweden, the UK and the USA all demonstrate low police recording rates.[8] For example, the British Crime Survey has found that three quarters of 'moderately serious' violent offences do not appear in police records.[9] When it has been studied, nowhere is this under-recording more obvious than in trauma services: studies in Bristol, Cardiff and Swansea, in the UK, have all shown that between three quarters and four fifths of assaults which result in hospital treatment do not appear in police records. Furthermore, police recording is shown to vary by patient age and gender and violence location such that, for example, violence in which older women are injured is much more likely to find its way into police records than violence in which young men are injured.[10,11] A principal reason for non-recording of violence by the police is lack of reporting. The injured may not report offences because they cannot identify the assailant, because they are afraid of reprisals and because of their hostile attitudes towards the police and reluctance to have their own conduct scrutinised too closely.[12] Intoxication – usually with alcohol – and being in hospital also decrease the chances or delay police reporting. Not surprisingly, violence associated with drug trafficking and violence inside bars and nightclubs is unlikely to be reported to the police. One study found that seven out of eight assaults inside premises licensed to sell alcohol which resulted in hospital treatment did not appear in police records.[10] A study from Denmark suggests that the extent of under-recording is similar across national boundaries. Here, the overlap between the population of victims known to the police and those known to a local hospital was 23% – remarkably similar to the extent of unrecorded violence in the UK.[13]

Not surprisingly, given these findings, it is not even safe to assume that the most serious violence will necessarily be detected by the police. For example, a study in Bristol showed that police recording was not related statistically to injury severity scores, and a study in the USA found that 13% of firearm violence identified in Atlanta emergency departments (EDs) did not appear in city wide police records.[14,15]

These findings raise an important justice issue. Unless trauma surgeons and emergency physicians judge – which they are not in a position to do – that all assault injuries are the fault of the injured patient, can it be right that week in, week out, injured people are admitted to hospital for surgical intervention when the cause of the injury – the assailant – is not even investigated let alone brought to book? Clearly, this applies to a large minority, even a majority of some kinds of violence. This sense of injustice has been a major motivation for surgeons to collaborate with local authorities and the police to try to prevent violence and, by all ethical means, to ensure that violent people are prevented from causing repeat injury.[16,17,18] Other motivations for surgeons and public health specialists to become involved include the enormous morbidity and mortality arising from violence – the motivation for the WHO 'Report on Violence and Health'.[5]

In some countries, such as the UK, these findings have prompted legislative change – the 1998 Crime and Disorder Act, for example, which imposes responsibility on health services, local government and the police to work together to audit and prevent crime.[17] A clause of the 2002 Police Reform Act brought Primary Care Trusts and Local Health Boards (in Scotland and Wales) formally into these local partnerships. Importantly, this legislation sets the scene for local communities to combine information from all principal sources in order to target finite prevention resources accurately.

These developments fit with the realisation that primary care

data have great potential to guide both national understanding and lead activity in preventing injury and illness.[19]

CORE DATA FOR PREVENTION

Since the principal responsibility of trauma surgeons is the effective and efficient care of trauma patients, processes for the collection and sharing of data which will help prevention need to be compatible with, and sustainable in, busy everyday surgical practice. Evaluations have found that the best way to do this is for emergency department reception staff to collect data electronically from assault patients and those who accompany them when they first arrive.[20] This means that busy clinical staff are not diverted from their core clinical tasks. However, leadership from senior emergency and trauma service staff is essential to ensure that the necessary processes are established in their departments and that effective working relationships are forged with local authorities and the police so that data are used to best effect. In the UK, a core violence dataset has been agreed with the Home Office and comprises six questions about the precise circumstances of violence: which street; which licensed premises or other location; which weapon was used – fist, feet, glass, bottle, knife, firearm or other weapon; how many assailants there were; and whether the incident was reported to the police and, if not, whether the patient would like hospital staff to report on their behalf.[20]

Once the data have been collected, it is a straightforward task for NHS IT staff to anonymise and share it regularly with local authorities and the police so that this information can be combined with police intelligence to identify particular locations where violence is concentrated, and to identify frequency of use of particular weapons, which can be the subject of prevention initiatives.[21]

Evaluations of the involvement of surgeons in this way have found that disclosure of these unique data to city authorities, the police, and local media enhance prevention by drawing substantial attention and crime prevention resources to the locations of violence.[17] This data sharing and local advocacy on the part of trauma surgeons has prompted the formation of local police task forces responsible for targeting city street crime, and overt and covert police interventions, targeted at violence hotspots such as particular licensed premises, and the use of injury data to oppose drinks/entertainment license applications by the alcohol industry.[17] These unique injury data, combined with police intelligence have also prompted changes to late night transport arrangements, changes in the routes of police patrols, transfer of police resources away from safe city suburbs to city centres, relocation of fast food outlets in city centres and the pedestrianisation of entertainment areas. One evaluation showed that the effectiveness of this violence prevention work was significantly enhanced when emergency physicians, in the context of a local crime prevention partnership activity, confronted nightclub management with injury images and data and told them that injuries in their premises were being audited in the local trauma service and that audit results would be published in the local media.[17]

Implementation of these pioneering measures in Cardiff has been followed by an overall decrease of 35% in numbers of assault patients seeking ED treatment (2000–5), compared with an overall 18% decrease in England and Wales over the same period; and a 31% decrease in assaults inside licensed premises in Cardiff city centre (1999–2001). Furthermore, according to Home Office data, by 2005, with the exception of Cambridge, Colchester, Southend and York, Cardiff was experiencing lower levels of violence ('all violence' and robbery combined) than all 55 towns and cities in England and Wales with a population of greater than 100,000.[22] In its Home Office 'family' of 15 similar cities (based on socio-economic and demographic variables) it has been the safest city according to these criteria for three years (2003–6). These findings show that it is not just data which are important, but also the contributions of emergency and trauma surgeons in their local communities working with key local agencies. Partnerships of all kinds work best if each of the partners contributes their unique information, expertise and capability to joint tasks and are committed to question and debate policy and resolve controversy.

This is familiar territory for public health specialists. In his classic epidemiological study which paved the way for the construction of London sewers to prevent cholera outbreaks, John Snow – an anaesthetist – painstakingly mapped cholera hotspots – the watering holes of Victorian London.[23] In the same way, similar prevention skills should be deployed now to identify and eliminate violence hotspot nightclubs and public houses – the 21st century watering holes of today.[18]

As with any worthwhile study, measurement methods, in this case of violence, need to be objective. Measurement, using injury records, is possible because all software systems in UK accident and emergency departments differentiate between accidental and intentional injury. This has facilitated study of several hundred thousand assaults, identified by means of trauma service data.[24] Reassuringly, setting these data alongside measures of unemployment, deprivation and other measures of economic activity, has demonstrated that this injury measure is indeed both valid and reliable.[25] Furthermore, these studies have demonstrated that the risk of assault injury is strongly inversely related to economic activity – high rates of assault injury are associated with low economic activity reflected in house prices and youth unemployment rates, for example. These validation studies have also identified previously unrecognised correlations, for example between the size of the ethnic minority population and violence, suggesting that trauma services may be a new opportunity to develop an early warning system for racist tension and violence.[25]

Alcohol consumption has long been associated with violence and disorder. Trauma service research has contributed to understanding the mechanisms by which alcohol consumption increases risk. It is now known that alcohol increases risk of injury through reducing physical competence, through poor decision making, through isolation in risky urban situations and by reducing the capability of the injured to identify their assailants or report offences.[26] An inverse relationship has also been found between alcohol prices and hospital treatment for injuries sustained in violence – lower beer prices are associated with higher chances of trauma service treatment.[25] This finding has prompted attempts to eradicate cheap drinks promotions and re-evaluation of alcohol taxation policy.

TRENDS IN VIOLENCE

Official crime statistics published by governments – police data and the results of crime surveys – have often generated more heat than light since trends derived from the two sources of data have often conflicted with each other.[7] Typically, over the period 1999–2005, police data have suggested steady increases

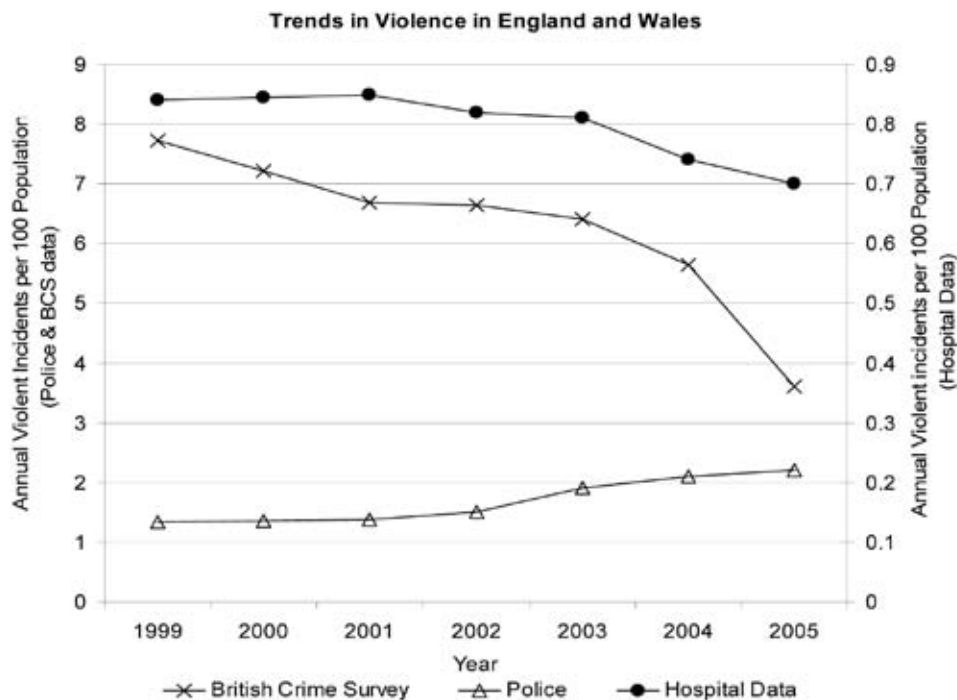**Trends in Violence in England and Wales**

Figure 1: *Trends in violence in England and Wales according to police, crime survey and injury data.*

in violent crime in England and Wales, whereas crime survey data have suggested steady decreases. Injury data derived from trauma services have brought clarity to these trends: findings from the National Violence Surveillance Project in England and Wales, in which trends are derived from ED data, demonstrate a significant reduction in violence over the same period (see Figure 1).[24] This is not to say that measuring violence from injury records is without limitations – no method of measurement is perfect – but this evidence does indicate that crime survey data are objective, that police data are not a reliable measure of violence and that rates of violence in England and Wales have fallen since 1999. This is reassuring for a confused public who, in the absence of clear information and often influenced by lurid media reporting, are increasingly fearful of violent crime.[7]

An evaluation of the effectiveness of closed circuit television (CCTV) in city centres has also shed light on violent crime trends.[27] A comparison of five large towns without urban centre CCTV with five with town centre CCTV showed that this surveillance system increased police detection rates for violence and disorder, compared with control towns with no CCTV surveillance. In contrast, trauma services in the towns with CCTV experienced a decrease in the numbers of assault patients seeking treatment in EDs, in contrast to control towns where an increase in assault patients was observed. This differential effect was interpreted as follows. CCTV, which is characterised by continuous radio links between those who watch CCTV monitors and police patrols on the ground, results in rapid detection of antisocial behaviour and violence and prompts rapid deployment of police patrols to these incidents

limiting violence so that less harm (injury sustained) is caused.[27] An illustration from the school playground is helpful here – if a teacher gets to a fight early then an incident has still occurred but no one has been hurt. Since most UK violence is concentrated in and around public houses and nightclubs in towns and city centres, this differential effect – increased police detection but decreased assault patients seeking treatment – was looked for in national data (Figure 1). This comparison showed that opposite trends according to police and injury data almost mirrored each other over six years demonstrating the injury prevention effectiveness of accurately and comprehensively targeted police activity. At the same time, this demonstrates the unreliability of police data as a measure of community violence.[7] In turn, this evidence from trauma services is prompting a review of the use of official crime statistics and at the time of writing, it seems likely that the UK Home Office will recommend the use of injury data to measure and prevent community violence.

COMBINING PATIENT CARE WITH PRACTICAL PREVENTION

A care pathway for the management of people injured in violence has been developed which combines treatment with prevention at every level of care, based on a series of randomised controlled trials and the evaluations summarised above (Figure 2).[28] Traditionally, the management of trauma patients has focused on physical injuries to the exclusion of almost all other violence risk factors and outcomes. The care pathway described here was designed to target risk factors such as the precise locations where injury was sustained, the

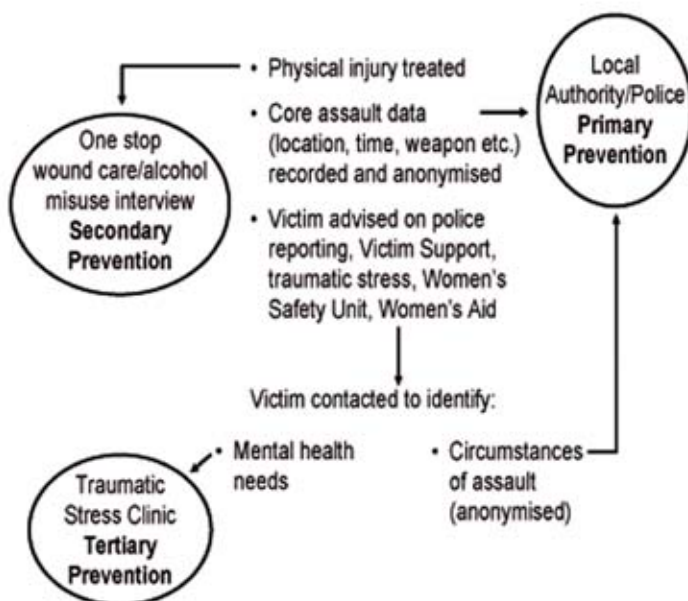## PREVENTING COMMUNITY VIOLENCE

Figure 2: Care pathway for assault patients attending trauma services.

weapons which were instrumental in causing injury and also a major risk factor for injury in violence – alcohol misuse. It also takes account of the mental health outcomes of violence – anxiety, depression and post-traumatic stress disorder and the need for mental health intervention.[28] Clearly, as cost-effective prevention interventions emerge, they should be incorporated into patient care to limit physical and psychiatric morbidity, to reduce risk of repeat injury and to develop safer communities. In this care pathway, in addition to the prevention initiatives described above, primary prevention is exemplified by the introduction of toughened and plastic beer glasses, secondary prevention is exemplified by trauma clinic and magistrate court brief alcohol misuse interventions (motivational interviews) and tertiary prevention is exemplified by cognitive behavioural therapy to prevent post-traumatic stress disorder[28].

PREVENTING GLASS INJURY

Trauma surgery research in the 1980s identified bar glasses and bottles as weapons for the first time.[6,29] The principal glass types – one pint capacity, straight sided lager glasses – were then identified together with the obvious morbidity which these assaults cause.[30] It was found that 75% of injuries were of the face, that eye injuries were infrequent but often serious and that, in the opinion of treating trauma surgeons, 75% of injuries were likely to result in very noticeable or noticeable scarring a year later.[30] Laboratory research then concluded that glasses typically used as weapons in violence which were tempered (toughened) in the manufacturing process had two potential injury prevention qualities – first, they were much more resistant to breakage and, second, when they did

break they disintegrated into relatively harmless (sugar lump) pieces with comparatively blunt edges compared to the more acute, sharp edges of non-toughened glass fragments.[31] A community randomised controlled trial was then carried out in which 57 public houses in the West Midlands and South Wales were restocked on a random basis either with toughened or non-toughened one pint capacity glasses. Injury data were provided by 1229 bar workers over the course of the trial.[32] Surprisingly, it was found that the injury rate was 60% higher in the intervention group – in those licensed premises which had been restocked with toughened glass (relative risk: 1.5 95% CI: 1.1-2.3). However, in laboratory testing it was found that the 'toughened' glasses had, in fact, been rendered less resistant to breakage in the toughening process and that the control glassware was more resistant to breakage. In this trial therefore, which turned out to be double blind, it was concluded that increasing the impact resistance of glassware was indeed associated with lower injury risk.[32]

These findings prompted the UK glass and alcohol retail industries to switch to toughened glassware.[33] Not surprisingly, one of the recommendations in the trial report was that a manufacturing standard was needed to regulate the toughening process: this has yet to be developed. Encouragingly, successive British Crime Surveys, in the year before and the year after the switch from non-toughened to toughened glass, demonstrated that, in the year before the switch, 13% of violence between strangers involved the use of glasses or bottles as weapons and that, in the year after the switch, this had reduced to 4%. It has been estimated that this equates with an annual reduction of 81,000 (95% CI: 47,000 – 115,000) in the number of violent incidents involving the use of glasses and bottles as weapons[9]. With the knowledge that increasing impact resistance of drinking vessels decreases injury risk, it is clear that the use of alternative materials – particularly plastic materials – can reduce the risks even further.[34] This remains a priority area for prevention since reductions in glass injury have not been maintained – probably reflecting availability and use of poorly toughened glass and increased availability of bottled drinks.

REDUCING ALCOHOL MISUSE

Substantial reductions in road traffic injury as the result of drink drive legislation and law enforcement prompts optimism that changing behaviour with regard to alcohol consumption is achievable in other contexts.[35] A practical way to achieve this has emerged from research on brief alcohol interventions which are motivational interviews designed to link alcohol misuse with risky behaviour in the minds of drinkers and, based on this, to prompt them to decide to reduce alcohol intake. This aims to capitalise on 'teachable moments', represented, for example, by an alcohol misuse-related admission to hospital or the aftermath of an alcohol-related injury.[36] Several meta-analyses of brief interventions have been published and there is no doubt that they are effective in a range of healthcare settings including trauma services.[37,38] These brief interventions have been found to be '...as effective as more expensive specialist treatment', and to 'double chances of consumption modification at 6–12 months'.[37,38]

Trauma clinics provide an excellent opportunity to deliver these motivational brief interventions.[39] Furthermore, this is the opportunity for a particularly cost-effective intervention, since trauma clinic nurses can be trained to deliver the brief

intervention concurrent with standard wound care (removing sutures, for example). A randomised controlled trial of this approach in maxillofacial clinics, which patients usually attend five to seven days after their injury when they are sober, has demonstrated effectiveness. One year later, for males aged between 15 and 35 who had consumed seven units of alcohol or more in the six hours prior to their face injury, the marginal benefit of this intervention was 22%. This means that, in addition to the alcohol consumption reduction prompted by the injury itself, the brief intervention converted a further one in five at-risk patients to safe drinking levels.[39] The results of a randomised trial of a similar intervention delivered to offenders, those who cause injury, immediately following sentencing in magistrates' courts has also demonstrated a significant reduction in injury sustained in the first year after the intervention but no significant effect on alcohol misuse or violent or other offending.[40] In sum, this evidence suggests that reducing alcohol misuse reduces the risk of injury more than the propensity to be violent and, therefore, that reducing vulnerability to injury is a better option than reducing aggression by this means.

PREVENTING POST-TRAUMATIC STRESS

Any traumatic event, including violence, may precipitate an acute psychological response. Characteristic features of this are fear, anger, recurrent distressing thoughts, guilt, depression, anxiety, bad dreams, irritability and generalised hyper-arousal (jumpiness). Such responses should be considered normal.[41] Most research on mental health outcomes of violent crime has focused on the psychological effects on women of sexual assaults. For example, Rothbaum *et al* (1992) studied 95 female rape victims prospectively and found that 47% had developed post-traumatic stress disorder (PTSD) by three months.[42] The prevalence of PTSD after physical injury of other kinds is lower but, according to most studies, around 30% develop PTSD.[41] Long-term psychological responses are more common after violence than after accident – a study of patients with jaw fractures found that, although levels of anxiety and depression were similar after one week, by three months levels had only reduced in the accident group.[43]

Perceived threat to life, physical injury, completed rape, high levels of emotional shock (acute stress) immediately following trauma, a psychiatric history, family psychiatric history, lack of social support and high neuroticism are all predictors of PTSD.[41]

Attempts have been made to prevent PTSD and other psychiatric disorders by providing psychological interventions shortly after major traumatic events. Very importantly, however, a Cochrane systematic review of randomised controlled trials of early single session psychological interventions that involved some reliving of the traumatic experience, compared with no intervention, found a negative effect on subsequent psychological distress, despite being well received by a majority of participants.[44] Complex, early psychological interventions using cognitive behavioural methods are more effective.[45,46] These findings and the effectiveness of exposure therapy for established PTSD led to the development of a four-session intervention that included elements of exposure therapy and cognitive restructuring.[47-48] Overall, however, universal as opposed to targetted brief psychological interventions – 'debriefing' – do more harm than good.[44] Mental health interventions which include straightforward explanations of the stress experienced and in which patients are encouraged to describe the assault in detail including their thoughts, feelings, sights, smells, noises, emotions and physical reactions, are most effective.[49] Challenging erroneous but perhaps natural beliefs that the violence is the patient's fault also seems to be important, as is 'image habituation' training where the traumatic image is kept repeatedly in mind.[50] Trauma patients often avoid the locations and circumstances in which injury took place for the rest of their lives – this avoidance behaviour can now be treated. Overall, interventions such as these significantly decrease the symptoms of post-traumatic stress.[48] For trauma surgeons, long-term psychological outcome is associated with higher levels of initial pain, emphasising the need for effective analgesia during surgical treatment.[48] Importantly, mental health sequelae other than PTSD, anxiety and depression, in particular, need to be identified and treated early.

Overall therefore, there is benefit in initial screening and referring patients with acute stress to mental health professionals for further screening and treatment. However, the prevalence of post-traumatic stress decreases in the months following injury, the effects of psychological interventions, though significant, are not large and there are cost-effectiveness challenges associated with multi-session mental health interventions. This is, therefore, an area where more research is needed to develop cost-effective combined surgical-mental health interventions.

CONCLUSIONS

What does all this mean for busy surgeons and dental surgeons responsible for treating those injured in violence? First, it means that injuries sustained in the cities and towns in which surgeons work can be prevented. Second, trauma surgeons can contribute distinctively and effectively to prevention by ensuring that data about the circumstances of injury are collected and shared. Third, surgeons can contribute to safety by working with colleagues in local government and the police particularly in the context of, now statutory, community safety partnerships. Here, the same lessons as those learned by surgeons in multi-disciplinary teams apply; joint approaches work well in the context of active, frank debate where there is mutual trust and commitment to the task in hand – in this case prevention rather than cure. Surgeons don't need to become qualified in, or switch to, a career in public health to contribute.

Prevention in terms of the narrow confines of medical specialisation is now often considered to be the purview of public health but this attitude needs to change. Surgeons with long-term appointments are of course authoritative senior citizens in the towns and cities in which they live. Legislation and guidance such as the European Directive on Human Rights, the 1998 Human Rights Act, data protection legislation and crime prevention legislation all encourage and make provision for collaboration to prevent, investigate and detect community violence. Regulatory bodies already encourage and expect prompt collaboration with the police and other agencies responsible for the prevention of domestic violence and child protection. The UK General Medical Council has recently advised prompt reporting of all gun shot wounds by emergency physicians.[49]

The development of effective mental health interventions, whether alcohol brief interventions or interventions to prevent post-traumatic anxiety, depression and other stress disorders

mean that all trauma teams should develop strong links with mental health services so that care pathways such as the one described in this article can be instituted. This is a challenge for all surgeons who treat trauma patients. Communities, towns and cities can be made safer and the burdens of trauma on health services and, most importantly patients can be reduced if surgeons are committed to prevention as well as cure.

It is proposed here that prevention becomes a core component of the training curriculum of every specialty and that this is incorporated into the policy of the UK Post Graduate Medical Education and Training Board (PMETB) and training regulatory bodies in other healthcare professions.

Copyright © December 2006

REFERENCES

1. *From Here Health: Celebrating 500 years of the Royal College of Surgeons of Edinburgh*. London: Stonegate, 2006
2. Burkitt DP. The discovery of Burkitt's lymphoma. *Cancer* 1983; **51**: 1777–86
3. Burkitt DP. Cancer of the GI tract: Colon, rectum, anus. Epidemiology and etiology. *JAMA* 1975; **231**: 517–8
4. Crumplin MK. The Myles Gibson military lecture: Surgery in the Napoleonic Wars. *J R Coll Surg Edin* 2002; **47**: 566–78
5. Krug EG, *et al* (Eds). World Report on violence and health, World Health Organisation: Geneva, 2002
6. Shepherd JP, Shapland M, Pearce NX, Scully C. Pattern, severity and aetiology of injuries in victims of assault. *J R Soc Med* 1990; **83**: 75–9
7. Shepherd JP, Sivarajasingam V. Injury research explains conflicting violence trends. *Inj Prev* 2005; **11**: 324–5
8. Farrington DP, Langan PA, Wikstrom P-O. Changes in crime and punishment in America, England and Sweden between the 1980s and the 1990s. *Studies in Crime and Crime Prevention* 1994
9. Mirrlees-Black C, Budd T, Partridge S. The 2000 British Crime Survey. London: HMSO, 2001 (Sub-analysis: Janson K. 2006)
10. Shepherd JP, Scully C, Shapland M. Recording of violent offences by the police: An accident and emergency department perspective. *Med Sci Law* 1989; **29**: 251–7
11. Sutherland I, Sivarajasingam V, Shepherd JP. Recording of community violence by medical and police services. *Inj Prev* 2002; **8**: 246–7
12. Cretney A, Davis G, Clarkson C, Shepherd JP. Assaults: the relationship between seriousness, criminalisation and punishment. *Crim Law Rev* 1994; **Jan**: 4–20
13. Faergemann C. Interpersonal violence in the Odense Municipality, Denmark 1991–2002. PhD thesis. Odense: University of Southern Denmark, 2006
14. Shepherd JP. Violence: The relation between seriousness of injury and outcome in the criminal justice system. *J Accid Emer Med* 1997; **14**: 204–08
15. Kellermann AL, Bartolomeos K, Fuqua-Whitley D, Sampson TR, Parramore CS. Community-level firearm injury surveillance: Local data for local action. *Ann Emer Med* 2001; **38**: 423–9
16. Shepherd JP. Emergency medicine and police collaboration to prevent community violence. *Ann Emer Med* 2001; **38**: 420–7

17. Warburton AL, Shepherd JP. Development, utilisation and importance of accident and emergency-derived assault data in violence management. *Emer Med J* 2004; **21**: 473–7
18. Warburton AL, Shepherd JP. Tackling alcohol related violence in city centres: effect of emergency medicine and police intervention. *Emer Med J* 2006; **23**: 12–17
19. Wanless D. Securing Good Health for the Whole Population. London: HMSO, 2004
20. Goodwin V, Shepherd JP. The development of an assault patient questionnaire to allow accident and emergency departments to contribute to Crime and Disorder Act local crime audits. *J Acc Emer Med* 2000; **17**: 196–8
21. Shepherd JP. The contributions of accident and emergency departments to community violence prevention. Cardiff: Cardiff University, 2005. www.cardiff.ac.uk/vrg
22. Gibbs B, Haldenby A. Urban Crime Rankings. London: Reform, 2006
23. Centres for Disease Control and Prevention (CDC) 150th Anniversary of John Snow and the pump handle. *Morbidity and Mortality Weekly Report (MMWR)* 2004; **53**: 783
24. Sivarajasingam V, Shepherd JP, Matthews K, Jones S. Trends in violence in England and Wales 1995-2000: An accident and emergency perspective. *J Pub Health Med* 2002; **24**: 219–26
25. Matthews K, Shepherd JP, Sivarajasingam V. Violence-related injury and the price of beer in England and Wales. *Applied Economics* 2006; **38**: 661–70
26. Shepherd JP, Brickley M. The relationship between alcohol intoxication, stressors and injury in urban violence. *Br J Criminol* 1996; **36**: 546–66
27. Sivarajasingam V, Shepherd JP, Matthews K. Effect of urban closed circuit television on assault injury and violence detection. *Inj Prev* 2003; **9**: 312–6
28. Shepherd JP. Victims in the National Health Service: Combining treatment with violence prevention. *Crim Behav Mental Health* 2005; **15**: 75–82
29. Hocking MA. Assaults in southeast London. *J R Soc Med* 1989; **82**: 281–4
30. Shepherd JP, Price, Shenfine P. Glass abuse and urban licensed premises. *J R Soc Med* 1990; **83**: 276–7
31. Shepherd JP, Huggett RH, Kidner G. Impact resistance of bar glasses. *J Trauma* 1993; **35**: 935–8
32. Warburton AL, Shepherd JP. Effectiveness of toughened glassware in terms of reducing injury in bars: A randomised controlled trial. *Inj Prev* 2000; **6**: 36–40

33. Anonymous. Industry switches to Toughened Glasses. London: *The Licensee*, October 27, 1997

34. Coomaraswamy KS, Shepherd JP. Predictors and severity of injury in assaults with bar glasses and bottles. *Inj Prev* 2003; **9**: 81–4

35. Shepherd JP. Criminal deterrence as a public health strategy. *Lancet* 2001; **358**: 1717–22

36. Gentilello L, Rivara FP, Donovan D, Jurkovitch G, Daramciang E. Alcohol interventions in a trauma centre as a means of reducing the risk of injury recurrence. *Ann Surg* 1999; **230**: 473–83

37. Effective Health Care Research Team. Brief interventions and alcohol use. Are brief interventions effective in reducing harm associated with alcohol consumption? *Effective Health Care Bulletin* 1993; **7**: 1–13

38. Mattick R, Jarvis T. Brief or minimal interventions for 'alcoholics'? The evidence suggests otherwise. *Drug Alc Rev* 1994; **13**: 137–44

39. Smith AJ, Hodgson RJ, Bridgeman K, Shepherd JP. A randomised controlled trial of a brief intervention after alcohol-related facial injury. *Addiction* 2003; **98**: 43–52

40. Watt K, Shepherd JP. A randomised controlled trial of alcohol brief intervention for violent offenders in a magistrate's court. Cardiff: Wales Office for Research in Health and Social Care, 2005

41. Bisson JI, Shepherd JP. Psychological Reactions of Victims of Violent Crime. *Br J Psychiat* 1995; **167**: 718–20

42. Rothbaum BO, Foa EB, Murdock T, *et al*. A prospective examination of post-traumatic stress disorder in rape victims. *J Trauma Stress* 1992; **5**: 455–75

43. Shepherd JP, Qureshi R, Preston MS. Psychological distress after assaults and accidents. *BMJ* 1990; **301**: 849–50

44. Rose S, Bisson J, Wessely S. A systematic review of brief psychological debriefing for the treatment of immediate trauma-related symptoms and the prevention of post-traumatic stress disorder. *Cochrane Library*, Issue 3. Oxford Update Software.

45. Andre C, Lelord F, Legeron P. Controlled study of outcome after six months to early intervention of bus driver victims of aggression. *Encephal* 1997; **23**: 65–71.

46. Bryant RA, Harvey AG, Dang ST. Treatment of acute stress disorder: a comparison of cognitive behavioural therapy and supportive counselling. *J Consult Clin Psychol* 1998; **66**: 862–66

47. Sherman JJ. Effects of psychotherapeutic treatments for PTSD: A meta-analysis of controlled clinical trials. *J Trauma Stress* 1998; **11**: 413–36

48. Bisson JI, Shepherd JP, Joy D, Probert R, Newcombe RG. Early cognitive-behavioural therapy for post-traumatic stress symptoms after physical injury. *Br J Psychiat* 2004; **184**: 63–9

49. Shepherd JP. NHS reporting of firearms injuries. Firearms Consultative Committee 12th Annual Report. London: The Stationery Office, 2004; HC1082: 17–21