Transport and Clinical Practice[1]

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Abstract

This article summarises the transport and health agenda for health care practitioners who seek to understand how transport-related issues affect the well-being of their patients, and how disease and symptoms affects their patients' ability to travel. It is a resource for general medical education; it may also be useful in specialist training and in the training of other health professionals, particularly nurses and therapists. There is a lack of awareness among many health care professionals of the health benefits of active travel, adverse consequences of car use, and the financial cost to health services in providing car parking spaces.

Keywords

Transport, Health, Disease, Healthcare, Healthcare professionals

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1. Introduction

Whilst most of the report *Health on the Move* 2 (THSG, 2011) is about health at a population level and the policy measures that are needed for its enhancement, it is important to remember that at the root of any population health effect are individuals experiencing real physical and psychological impacts upon their health. Such symptoms and diseases may cause problems for travelling or may have been associated with transport-related factors.

This article summarises the transport and health agenda for health care practitioners who seek to understand how transport-related issues affect the well-being of their patients. It is written from a clinical perspective and is intended as a resource for general medical education. Sections of it may also be useful in specialist training and in the training of other health professionals, particularly nurses and therapists. For many clinicians, 'transport' in their work context relates to arranging travel for patients to and from healthcare facilities and appointments, whether by emergency or non-emergency transport or through community transport and/or volunteer drivers. There is a lack of awareness among health care professionals of the health benefits of active travel, adverse consequences of car use, and the financial cost to health services in providing car spaces.

This article includes information both on the impacts of transport on disease risk in adults and the effects of disease on the need or ability of adults to travel independently. It complements the information provided elsewhere in *Health on the Move* 2 (THSG, 2011), which will each be updated and published in future issues of this journal. Of necessity, this article touches briefly on a wide range of issues; cross-references to specific chapters or sections of *Health on the Move 2* that provide more detailed information are given as 'HotM2'

2. Health consequences of physical inactivity

2.1 Physical activity

Inadequate physical activity, (less than 150 minutes of moderately intense, or 75minutes of vigorous activity throughout the week), is identified by the World Health Organisation (WHO) as the fourth leading risk factor for global mortality, with approximately 3.2 million deaths annually attributable to insufficient physical activity (WHO, 2010). Physical inactivity contributes to obesity, and hence hypertension and type 2 diabetes, circulatory diseases and osteoporosis. Physical activity also improves mental well being, reduces the incidence of mental illness, and can be an effective treatment of depression (see section 3.1 below).

Increasing use of passive modes of transport and barriers to active modes of transport through high-density traffic, air pollution, and lack of perceived safety for cycling / walking

contribute to the rise in physical inactivity. Finding time for organised sports or fitness programmes can be difficult. Encouraging active transport methods over passive transports methods is one method of increasing physical activity, allowing people to increase their physical activity by building into their routine daily life (CMOs, 2011). Using stairs rather than the lift is one simple measure but will not in itself be enough. Travel to and from work, school, or other daily activities is a good opportunity to build physical activity into the daily routine.

Walking and cycling are healthy means of transport. Cycling is especially useful as it is faster than walking and can therefore be used over greater distances. Sarcopenia, the loss of muscle mass with age, is associated with inactivity and increased risk of falls. It can be reduced and even reversed by resistance exercise. Reduced physical activity in old age leads to a downward trajectory of mobility, falls and loss of confidence so walking and cycling should still be strongly encouraged even in those with significant limiting cardiovascular or musculoskeletal illness (Sayer et al, 2013).

Some people give concerns about safety as the reason for not cycling. Cycling does not reduce the individual's life expectancy: it increases it considerably (Hillman, 1992). In summary, the risk in the UK of fatality is of a similar order of magnitude for walking, cycling or driving, when 'like-for-like' comparisons are made, allowing for different risks by age and sex and time spent travelling (Mindell et al, 2012). For most groups, there is a slight increased risk of cycling relative to driving but it is no greater than many other risks that people take in everyday life, such as driving on all purpose roads rather than motorways or driving instead of taking the train. However, for males aged 17-20years, the risk is up to five times greater for driving than cycling (Mindell et al, 2012). Furthermore, the risk of cycling is lower than for walking, as has also been found in the USA, Germany and the Netherlands (Pucher and Dijkstra, 2003). In the Netherlands, there is little difference by mode (de Hartog et al, 2010), which is often ascribed to the cycling infrastructure and/or the high prevalence of cycling, but may also be due to the preponderance of males among drivers and females among cyclists ().

For the population as a whole, the risk of cycling is more than offset by the reduced risk (relative to driving) of injury to third parties whilst for the individual cyclist the small risk is far outweighed by the considerable health benefits. An additional disincentive to cycling can be a requirement to wear cycle helmets, whether because of dislike of wearing them or the implied message that cycling is dangerous. The evidence on the effectiveness of cycle helmets in preventing- or even increasing – serious injury is limited (HotM2 chapter 7) but the evidence is strong that mandatory helmet laws discourage cycling

The many interventions that can be implemented to promote active travel are beyond the scope of this article but healthcare professionals should lobby for and support effective policies. Some are aimed at individuals (e.g. route planning or cycle training) but those most likely to reduce inequalities will target the environment, such as Age-Friendly and Liveable Communities (FTA, 1998; WHO, 2009); urban planning that promotes active travel, including pedestrian permeability; slower road speed limits; and improved facilities, including to/from and at healthcare premises).

For people whose journey to work is too long to cycle, public transport offers more physical activity opportunities than driving and can be sufficient to fulfil the weekly physical activity recommendations (Besser & Dannenberg, 2005; Freeland et al, 2013). Walking to and from the station, walking to and from a bus stop on a high frequency route, walking between stations, and getting off one stop before your destination and walking the rest of the way are all viable approaches. There is also increasing provision for cycle parking at stations and modal interchanges, while an increasing minority of buses can carry bicycles, although these are often restricted on trains during 'rush hour' – main commuting times.

2.2 Sedentary behaviour

The adverse health consequences of sedentary behaviour (activity with very low energy expenditure – less than 1.5 times the resting rate, undertaken primarily sitting or lying down) are now known to be additional to the harms from inadequate physical activity (Biddle et al, 2010; Ford and Casperson, 2012). Even among adults who meet physical activity guidelines, obesity risk is related to time spent being sedentary (Stamatakis E et al, 2009), as are worse physical and mental health outcomes (Hamer et al, 2010; Stamatakis et al, 2011). Evidence is beginning to suggest that the specific type of sedentary behaviour engaged in is also important, with suggestions that screen-based entertainment has particularly detrimental effects on obesity and other health biomarkers (Stamatakis et al, 2012).

An American study found that obesity risk increased by 6% for every hour per day spent travelling by car (Frank et al, 2004) The extent to which this is because of the sedentary behaviour itself or as a proxy for not undertaking active travel is unclear. The same study found a 4.8% reduction in obesity risk per km walked per day.

3. Mental health & transport

The associations between mental health and transport are complex. Active transport is associated with improved mental health and may be recommended as a treatment for mental illness, but some mental illnesses may prevent travel either through fear or

restrictions on use of vehicles. Lack of access to transport may also be associated with mental health disorders. Many associations between transport and stress are described in detail elsewhere (HotM2 section 5.1) so have not been repeated here.

3.1. The benefits of active transport

There is a substantial body of evidence demonstrating that walking has significant benefits to mental health (Manson et al., 2002; Murphy et al., 2002; Tsuji et al., 2003; Fritz et al., 2006; Sugiyama et al, 2008). Physical activity and hence active transport is associated with improved subjective well-being, mood and emotions. These effects are seen within all age groups and are independent of socio-economic or health status (Biddle, 2000). Physical activity can also improve self-esteem (Fox, 2000) and can result in positive changes in certain aspects of physical self-perception, such as body image or self-worth. The effect is stronger for those with initially low self-esteem such as mental health patients and those with mild depression. Active individuals also report fewer symptoms of anxiety or emotional distress and improved sleep patterns. Inactive people are more likely to develop clinically defined depression (Camacho et al, 1991).

Physical activity is effective in reducing clinical symptoms in those diagnosed with severe, moderate or mild depression (Mutrie, 2000) and has been shown to be as effective as (Craft & Landers, 1998) or even more effective than (Rimer et al, 2012) traditional treatments such as psychotherapy. Those who maintain physical activity for at least six months report less use of medication and are more likely to recover than those who rely solely on medication. There is also strong evidence that physical activity has a positive effect on anxiety with the most notable effects among those who maintain physical activity programmes over several months (Scully et al, 1998). However, it should be noted that these studies were of physical activity per se, not active travel. Projects such as Bike Minded in the UK are aimed at encouraging mental health service users to cycle by offering organised rides, cycle training, bike maintenance courses and vocational activities (Lifecycle UK, 2013).

3.2. Restrictions on vehicular travel

A systematic review of the literature on motor vehicle crashes and mental illness found that motor vehicle collision rates were higher among certain driver sub-groups including those having the most severe degree of mental illness and those using specific psychotropic medications such as benzodiazepines (Ménard & Korner-Bitensky, 2008). In England the DVLA (Driver and Vehicle Licensing Authority), which is responsible for issuing motor vehicle licenses, may not grant and may revoke a license to persons with severe uncontrolled anxiety, severe depression with marked psychomotor retardation and/or psychosis, bipolar disorders including hypomania or mania, acute psychotic disorder, schizophrenia or other

chronic psychosis (DVLA 2013). Similarly, The Department of Motor Vehicles in the United States may restrict, suspend or revoke a driver's license based on medical conditions. This varies per state, and often relies on individual driving assessments.

3.3. Fear of travel

Individuals with certain mental health disorders (esp. agoraphobia, obsessive compulsive disorder) may fear travel. There are also phobias specific to transport type (aerophobia – flying; siderophobia – trains). Persons with agoraphobia may restrict travel, may need a companion when away from home, or else endure agoraphobic situations despite intense anxiety (Wittchen, 2010).

3.4. Access to transport

Individuals in Britain who reported feeling isolated as a result of the lack of transport (public or private) were more than three times as likely as the sample as a whole to have a GHQ score (general health questionnaire score, which measures minor psychiatric morbidity) indicative of depression (Payne).

4. Transport and external causes of ill health

4.1. Transport related poisoning

In addition to the cardio-respiratory effects of air pollution from transport emissions (HotM2 section 3.1 and sections 5.1 and 5.2 below), a number of other transport related chemical hazards have been described. These include scrotal cancer due to oil (Health & Safety Executive, 2013) and asbestosis in shipbuilding and carriage-making (Health & Safety Executive, 2012). Although most cervical cancer is caused by HPV infection, most of the small number of non-HPV cases are occupational: most of those are due to oil, although some are due to work with biological materials. Transport also causes some cases of cervical cancer in women who work in oily occupations or whose partners work in such occupations (Rushton, 2010).

4.2. Transport related violent injury

Carbon monoxide poisoning from vehicle exhausts and jumping in front of trains or off bridges are common forms of suicide (Thomsen, 2006). Some inexplicable single vehicle crashes may also be suicides (Routley et al, 2003).

Cars can be used as weapons to carry out violent attacks. Other forms of transport could also theoretically be used in this way but this is less common, although aircraft were the

weapon in the mass murders at the Twin Towers and people are sometimes pushed in front of trains.

Road rage, defined as "an incident in which an angry or impatient motorist or passenger intentionally injures or kills another motorist, passenger, or pedestrian, or attempts or threatens to injure or kill another motorist, passenger, or pedestrian" is a recognised phenomenon and is distinct from aggressive driving (Rathbone & Huckabee, 1999). It has been termed a psychiatric phenomenon (Fong et al, 2002) and is more common in people with borderline personality disorder (Sansone et al, 2010) but has also been linked to occupational effort-reward imbalance and emotional wellbeing (Hoggan and Dollard, 2007). Almost 90% of drivers interviewed in one UK study reported experiencing a road rage incident in the previous year, and 60% admitted they had lost their temper when driving (Joint, 1995). It has also been reported in Pakistan, occurring in inverse proportion to length of experience as a rickshaw driver (Shaikh, 2011). In Canada, almost half of interviewees had shouted at or been shouted at by other road users in the preceding year, with one in ten reporting violence or threats of violence (Smart et al, 2003). An American study found that an angry/threatening driving subscale (but not verbal/frustration expression) was associated with hazardous driving behaviours, including 'drink-driving', regularly exceeding the speed limit, and having a crash. However, were associated with receipt of tickets in the past year (Wells-Parker et al, 2002). Sansone et al (2010) also noted the association of driving tickets and road rage.

4.3. Transport related crashes

The treatment of the injuries resulting from transport-related crashes is a subject which is well covered in textbooks of emergency surgery and it would not be useful to repeat it or attempt to summarise it in this article. One important transport-related issue in relation to transport injuries is the centralisation of Emergency Departments in many countries, to produce larger, better-staffed departments. The public are often concerned that such centralisation risks lives by making it necessary to take casualties further with consequent delay. The profession tends to believe that this risk is offset by greater expertise and facilities. However, centralisation of Emergency Departments tends to lead to centralisation of hospitals and hence more travel by patients, visitors, and staff. Another issue is the provision of immediate care at the crash site.

Collision, and thus injury, risk is increased by factors that distract the driver, including the use of mobile phones, even if hands-free (Burns et al, 2002; Parkes et al, 2007), smoking, eating or drinking while driving, both through taking hands away from the car's controls and

also as a distraction from the road and traffic. The influence of vehicle design, roadway layout, speed, driver and other road user factors are discussed in HotM2 chapters 4 and 18.

5. Disease and transport

5.1. Cardiovascular disease

Heart disease is both a stress-related disease and a disease of physical inactivity. Long term exposure to carbon monoxide increases arteriosclerosis and causes heart disease and stroke. While smoking is the commonest source of exposure, road users are also exposed, with drivers exposed to higher levels of carbon monoxide compared with cyclist and walkers, and car users exposed to higher levels than bus users (Kingham et al, 2013). Particulates also contribute to heart disease, both precipitating hospital admission and premature mortality (DEFRA, 2007; HotM2 section 3.1).

People who have a stroke, or acute coronary syndrome cannot drive for a month but do not have to inform Driving and Vehicle Licensing Authority (DVLA) unless the symptoms last longer than this or their doctor says they should not resume driving until after a longer period (DVLA 2012). However, these events may lead to permanent loss of licence and therefore livelihood for lorry (heavy goods vehicle (HGV) and public transport (public service vehicle (PSV) drivers (DVLA 2012).

Following a stroke, some people may have hemi-inattention, visual field deficits or seizures which render them unfit to drive for longer, possibly permanently. Some of these people may also be unsafe as pedestrians or cyclists, because of a lack of awareness of traffic, obstructions, and other dangers. Disability, such as a physical deficit following a stroke or significant angina that limits walking, often limits mobility (HotM2 chapter 9).Specialist occupational therapists can advise in individuals if deficits are obvious. Formal driver assessment by the licencing agency is available in most developed countries and should be sought if decisions are difficult or people fail to take advice or be a danger.

5.2. Respiratory disease

Motor vehicle emissions contribute to respiratory disease (DEFRA, 2007). Particulates, nitrogen oxides and ozone all cause lung damage. At high concentrations, nitrogen dioxide causes inflammation and irritation of lung tissue, increasing susceptibility to viral infection, bronchitis and pneumonia. Particulates, especially those < 1μm diameter, can be inhaled deep into the lungs where they can cause inflammation and a worsening of heart and lung diseases. Exposure to particulate matter is consistently associated with respiratory and

cardiovascular illness and mortality. Ozone also reduces lung function: very high levels increase the symptoms of those suffering from airway diseases such as asthma and bronchitis, leading to increased incidence of respiratory hospital admissions and mortality. Polycyclic aromatic hydrocarbons in vehicle exhaust emissions cause lung cancer.

Traffic pollutants, particularly fine particulates, have long been known as a major exacerbator of asthma (Joffe & Mindell, 2004). Although they have been postulated recently also to cause asthma, expert opinion is that this occurs rarely, among those exposed to the heaviest pollutant loads (COMEAP, 2010). Whether pollution from traffic causes or exacerbates asthma may be of little importance to the patient. Acute increases in air pollution trigger exacerbations of asthma in susceptible individuals, especially children (Patel & Miller, 2000). Organic compounds and metals such as iron and vanadium bound to diesel particulates in traffic pollution increase the risk of asthma (Patel & Miller, 2009). Early exposure to pollution from traffic increases the risk of developing symptoms in normal, healthy children (Bråbäck & Forsberg, 2009). Evidence in the UK, accepted by the Environmental Audit Committee of Parliament in 2010, is that previous estimates of extra deaths and deaths brought forward may be an underestimate. In June 2010 the Mayor of London published data from the Institute of Occupational Medicine which estimated that 4,267 premature deaths a year were due in part to long-term exposure to airborne particles (Mayor of London, 2010).

It is therefore sensible for those with early respiratory disease to be advised to reduce non-essential exposure to motor traffic. Pollutant levels are generally higher inside vehicles than in the street (Kingham et al, 2013). Walking and cycling along quiet roads or travelling by train is better than using main roads (Gee & Raper, 1999; Praml & Schierl, 2000). However, severe respiratory disease can affect the pace of walking and the distance that can be walked.

Some transport-related industries such as shipbuilding and carriage-making have in the past resulted in asbestos exposure which, due to periods of latency, are still causing many new cases of asbestosis and of mesothelioma, particularly in smokers; coach and vehicle body builders have the highest proportional mortality ratio for mesothelioma in Britain (Health and Safety Executive, 2009).

5.3. Gastrointestinal disease

Some gastrointestinal diseases, including minor gastrointestinal upset, are stress-related (HotM2 section 5.1). People with certain gastro-intestinal diseases may have frequent and/or urgent need for a toilet, which can limit certain travel options.

5.4. Infectious disease

The ready availability of international travel has increased the mixing between ecosystems. This has a number of effects. It means that infectious diseases spread by droplet, by sex or by blood-mixing will definitely spread more rapidly across the world once they have become established. Whether this will also happen to water-borne diseases or to vector-borne diseases depends upon the circumstances but the risk is certainly there. There is a theoretical risk of carrying a vector insect aboard an aircraft, ship or international train but this has not happened often, although malaria cases do, rarely, occur in non-travelling residents living near international airports (Mouchet , 2000). The infection is usually with the more serious *Plasmodium falciparum*. With a water/food-borne disease, such as typhoid, movement of a carrier or a case will not necessarily spread the disease unless there is also poor hygiene or employment in food preparation. With such infections, international spread has often been by carriage of infected products.

As well as the spread of infectious diseases outside their normal ecosystem, there is also the risk to people who intrude into ecosystems where they do not have immunity to local disease. A common cold is a frequent consequence of travel for this reason. More serious are diseases like yellow fever and malaria. Travellers should always be advised to take appropriate precautions, including the use of physical barriers (clothing, impregnated bed nets) as well as recommended or required vaccines and recommended prophylactic drugs.

Mixing of ecosystems may however also have a beneficial effect. The virulence of a disease is an obstacle to its spread and the tendency is for infectious diseases to become less virulent over time as natural selection favours both the more resistant hosts and the less virulent organisms. However if this happens in one ecosystem and the local population becomes immune to it, it may remain virulent in other ecosystems and yet at the same time become more transmissible creating a situation where it may be spread by travellers into an immunologically naive and therefore susceptible population. The most widely cited examples of such disasters – the spread of smallpox into Latin America (Burnet & White, 1972, p122), measles into the Pacific Islands (Burnet & White, 1972, p16) and the 1918 flu pandemic with demobilising troops (Erkoreka, 2010) all occurred either before international travel became normal or at a time when it was disrupted.

Respiratory diseases such as influenza can be transmitted from infected to susceptible individuals via four direct and indirect mechanisms, each of which modes could occur when on public transport, where people are regularly in closer contact with larger numbers of people than they would otherwise be. However, the relative importance of these different modes of spread for influenza is disputed (Brankston, 2007).

Overcrowding can lead to direct physical contact between people, with direct transfer of infectious agents. Secondly, infected individuals produce large droplets that can travel up to 1m during sneezing, coughing or even talking, with deposition on susceptible individuals' mucosae. Droplet spread is therefore very likely in public transport, as passengers are frequently within 1m of each other. Thirdly, airborne spread can occur over longer distances, as small infectious particles remain suspended in the air for long periods. The enclosed nature of most public transport vehicles therefore facilitates airborne transmission. Finally, most public transport vehicles have many hard surfaces, such as door handles or button and hand rails, that are touched by large numbers of passengers. Influenza viruses can survive on hard surfaces for up to two hours (Bean, 1982), so indirect contact through contamination of these surfaces is also a significant route for disease transmission. Despite these theoretical modes of transmission, no outbreaks of influenza have been reported in relation to public transport apart from aeroplanes (Klontz et al, 1989; Moser et al, 2009).

The UK pandemic plan advised the public to minimise leisure and social (i.e. non-essential) travel to reduce their personal risk but recommended that while public transport could continue to be used for essential journeys, good personal hygiene measures were important (DH, 2007). Staggering journeys where possible would reduce overcrowding at rush hour but this may reduce only the direct person to person spread, given that the other three mechanisms described above are still likely to operate. Mathematical modelling to investigate the effect on spread of pandemic influenza of restricting travel to within 20km of the home in the UK and USA found that this would reduce spread of infection from one area to another only in conjunction with effective border control (Ferguson et al, 2006). However, the authors viewed travel only as a means of moving infected individuals from an area of existing infection to another area where they could spread the infection; they did not consider the impact of travelling on public transport per se as an effective means of increasing transmission of infection.

5.5. Musculoskeletal Disease

Osteoporosis is a disease of physical inactivity (see section 2 above). Many musculoskeletal diseases cause reduced and/or painful mobility that affects all modes of transport. Sufferers may be unable to stand for prolonged periods or use steps and may take longer to get on and off public transport. They may also have difficulty getting in and out of cars, whether as a driver or a passenger. Those with marked arthritis of the hands, or with neurological disease, may be unable to hold onto handrails for support on public transport. Cycling may be a useful form of transport for people with arthritis of weight-bearing joints, such as the knee, hip or ankle, in whom both speed and distance for walking are often limited by pain.

There has been a single research study associating rheumatoid arthritis with traffic (Hart et al, 2009). Further studies are required to assess whether this was a chance (false) finding, was due to unmeasured confounding, or whether fine particulates or other traffic pollutants are truly associated with greater risk of developing rheumatoid arthritis.

Sarcopenia, described in section 2.1 above, and a propensity to fall can be addressed through chronic disease self management programmes (Roybal Center Consortium, 1998) and other fall prevention programmes.

5.6. Genitourinary tract disease

Scrotal cancer and cervical cancer due to exposure to oil have been mentioned in section 4.1 above.

Incontinence or an urgent or frequent need to use a toilet is often an obstacle to walking and cycling – indeed to going out at all – if people are not confident that there will be toilets readily available when they need them. This is an advantage of intercity travel by train or coach rather than car but does not yet apply to urban travel. Provision of public toilet as part of creating ‘’liveable communities’ can help (e.g. www.brooklinecan.org/restroom-list).

Incontinence on transport provided to and from Adult Day Services (for health or social care) can also be a risk factor for premature institutionalisation. It is important that drivers and staff, as well as family members, receive adequate training about continence schedules.

5.7. Neurological disease

Mention has been made of stroke in section 5.1 above. Most neurological diseases have similar effects to those described for stroke and/or musculo-skeletal disease (sections 5.1 and 5.5 above). Some neurological diseases, such as multiple sclerosis, can also affect balance. In addition, they can also affect bladder or bowel control, leading to problems of incontinence. As discussed in sections 5.3 and 5.6 above, these can be a substantial deterrent to travel and can severely limit the options available.

Dementia of any cause affects driving and people rate themselves as safer than they are (Freund et al, 2005). This problem will increase with the number of older drivers. Guidance for licencing authorities and others exists (Adler & Silverstein, 2008). People with dementia often get lost when walking and low tech (labelling people) and high tech (tracker devices) solutions can be used to manage this.

5.8. Cancer

Cancer is, in part, a stress-related disease (HotM2 section 5.1). Although the well documented associations between cancer and life change, unsatisfactory circumstances or

low wellbeing are often explained as due to confounding, a biologically plausible causal explanation could be the diminution of the immune response as part of the stress reaction, which also explains the association with infections. Scrotal cancer and cervical cancer due to exposure to oil are discussed in section 4.1 above. Pleural mesothelioma is a consequence of asbestos exposure (section 5.2 above), associated with shipbuilding and carriage-making.

Benzene and 1,3-butadiene are carcinogens in vehicle exhaust emissions and also emitted when filling vehicles. They are particularly associated with leukaemia (IARC, 2013a; IARC, 2013b). 1,3-butadiene is also associated with lymphoma and cancer of lymphoid and blood-forming tissue, though the evidence is less clearcut (IARC 2013b). Polycyclic aromatic hydrocarbons, also found in vehicle exhaust emissions, are also carcinogenic.

6. Effects of disability on transport

Impairment and transport are covered in detail elsewhere in *Health on the Move 2* (chapters 9 and 13). A few points of specific relevance to this article are summarised below. Functional impairments, which generally increase with age, can affect the ability to drive, or to use other modes of transport. Loss of independence due to an inability to drive and then a further loss due to becoming too frail to use public transport are important factors in the decline into dependency. Transport policy options to enable older people to maintain independent mobility are important, particularly for those with dementia, for example: even for older people with recourse to family and other support, the burden on carers is increased if they are also acting as chauffeurs (Taylor, 2001). Both independent and dependent older people in rural areas may be unable to travel far, and a minority may be housebound due to lack of transport options (Gant & Smith, 1988). Although increased car ownership has increased mobility for older people in recent decades, this does not detract from the impact on health when license holding or car use has to be given up for health reasons.

6.1. Driving and impairment

Functional deterioration in vision, hearing, co-ordination, and mental processing of information can each lead to impaired ability to drive, particularly in the dark. Occupational therapists and Driver rehabilitation specialists can help with assessments and adjustments for such impairments.

In addition to these endogenous causes of impairment, any alcohol, some prescribed medication, and some illegal drugs can affect an individual's ability to drive (HotM2 section 17.6).

6.2. Legal issues

In the UK, the General Medical Council's updated advice on Confidentiality, which came into effect on 12th October 2009, and its supplementary advice also covers reporting patients to the DVLA, even where that breaches confidentiality (GMC, 2009).

"Personal information may be disclosed in the public interest, without patients' consent, and in exceptional cases where patients have withheld consent, if the benefits to an individual or to society of the disclosure outweigh both the public and the patient's interest in keeping the information confidential. You must weigh the harms that are likely to arise from non-disclosure of information against the possible harm, both to the patient and to the overall trust between doctors and patients, arising from the release of that information.

"Disclosure of personal information about a patient without consent may be justified in the public interest if failure to disclose may expose others to a risk of death or serious harm. You should still seek the patient's consent to disclosure if practicable and consider any reasons given for refusal."(GMC, 2009)

Similar changes to ethical guidelines were also introduced by the American Medical Association (AMA, 2010).

In most post-industrial countries, there are legal requirements and restrictions on driving. It is the Driver and Vehicle Licensing Agency (DVLA) in England, Scotland and Wales and the Driver and Vehicle Agency (DVA) (Northern Ireland) that are legally responsible for deciding if a person is medically unfit to drive. They therefore need to know if a driving licence holder has a condition or is undergoing treatment that may now, or in the future, affect their safety as a driver.

Doctors are advised to seek advice from an experienced colleague or the DVLA or DVA's medical adviser if unsure whether a patient may be unfit to drive and to review any decision that they are fit, particularly if the patient's condition or treatments change. The DVLA has published information about a variety of disorders and conditions that can impair a patient's fitness to drive (DVLA, 2012).

Although it is the driver him/herself who is legally responsible for informing the DVLA or DVA about such a condition or treatment, it is the doctor's responsibility to explain to the patient both that the condition may affect their ability to drive, and that they have a legal duty to inform the DVLA or DVA about the condition.

Where a doctor does not manage to persuade the patient to stop driving, the patient is incapable of understanding the doctor's advice, for example, because of dementia, or the doctor discovers that the patient is continuing to drive against medical advice, the doctor must contact the DVLA or DVA immediately and disclose any relevant medical information, in confidence, to the medical adviser. However, the doctor should try to inform the patient of their decision to disclose personal information before contacting the DVLA or DVA, and should also inform the patient in writing once the DVLA or DVA has been informed (GMC, 2009). In the USA, there is variation by state whether such reporting is mandatory or voluntary, and by whom (Stutts and Wilkins, 2009).

Referral for a specialised on-road driving assessment by an occupational therapist or driving rehabilitation specialist can move the decision from the clinical setting and avoid disruptionof the doctor-patient relationship (Maguire & Schold Davis, 2012)

7. Old age and transport

Functional impairments that impede travel, particularly driving are discussed in section 6 above. Age is associated with many acute and chronic medical conditions. These and drugs used for them can adversely affect driving skills. They also affect other transport options leaving many older people with difficult decisions about surrendering mobility or maintaining it at risk to themselves and sometimes to others. (Dickerson et al, 2007). Most older drivers are safe drivers. About 10-15% of older drivers are presumed to be at risk, particularly from impairments to critical driving skills related to dementia (section 5.7 above).

Current knowledge and need for research related to old age and transport were summarised in a paper published in 2008 (Fildes, 2008). Short car journeys by elderly drivers are important for their continuing independence, although they may cause substantial anxiety to their younger relatives. Crashes per mile are low and generally result in little injury (Hakamies-Blomqvist, 2002), except for those driving less than 3,000km annually (Langford, et al, 1989). Involvement in collisions is higher per mile driven in drivers aged 75 and over but fragility – susceptibility to serious or fatal injury if involved in a collision – is increased from the age of 65 and over (Li et al, 2003). Fatal crashes at night were lower in older people (aged 65+) than in young drivers (under 25), although they were higher than in adults aged 25-64 (Mortimer & Fell, 1989). As healthy life expectancy increases in most countries worldwide and age-specific disease rates fall, it is important to review and repeat such studies for current cohorts.

8. Health Promotion In General Practice

In promoting the health of their patients, health care professionals (HCPs) must comprehend the multifaceted relationship between health and transport, and apply it to the patient sitting in front of them. HCPs must be able to assess the impact of current transport behaviour on an individual patient's current and future health, and assess and advocate changes in transport behaviour, e.g. encouraging active transport over passive transport. Given the increasing rates of obesity, contributed to by falling activities levels, it is likely that the majority of patients would benefit from increasing physical activity through active transport.

Brief intervention by HCPs can influence behaviour change and can be used to encourage active transport. HCPs familiar with walking and cycling routes in their vicinity can advise patients how to build these into their daily journeys. Those involved in their local community may lend support for 'living streets' (Living Streets 2013; Complete Streets 2013), lower speed limits, walking and cycling networks, and improved public transport. Surgeries should have adequate cycle parking for staff and patients as well as good links to public transport.

The campaign to abolish car parking charges for staff by a major Nursing journal illustrates the dependence HCPs have on their car. Until HCPs understand and acknowledge the impact of transport on health and change their own behaviours; they are unlikely to effectively advocate active transport to their patients. Many HCPs have set excellent examples already, by walking and cycling to visit patients, but more need to be encouraged to do so.

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Glossary

Emergency Department (formerly called Accident & Emergency Department (A&E) in the UK): Emergency Room (ER)

General practice: Primary care / family physician

Living Streets: Complete streets