



A falls handbook

A guide for all involved in falls
management and prevention

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“ Falls are the biggest cause of some 2.7 million accidents which happen in the home every year and necessitate a visit to the hospital. Falls account for 40% of non-fatal injuries. ”

Why do we fall?

We all suffer falls occasionally. However, the older we get, the more susceptible we become. And, unfortunately, these falls are likely to result not only in more injuries, but injuries of a more serious nature.

Slips, trips and stumbles all tend to occur as a result of environmental factors such as poor lighting, uneven surfaces and hazards that are present in every home. Poor eyesight or infirmity makes a person increasingly vulnerable. None the less, many accidents can be avoided by removing fall hazards. See our handy “do’s and don’ts” check-list on page 5.

Other falls including collapses are more difficult to explain. They can have physiological causes or might even result from the side-effects of medication for other chronic illnesses. The unpredictability

of these falls and the likelihood that they will recur, unless and until medical help is sought, can be a frightening prospect. This fear can make people afraid to venture out, reducing confidence and mobility. This in turn can increase the chances of suffering another type of fall.

It’s a vicious circle. But it’s one that can be broken. As well as removing fall hazards, it is important that any fall can be quickly detected. The assurance of early detection of a fall and the certain knowledge that help is on its way are essential to reduce anxiety and restore confidence.



“Each year there are more than 1 million non-fatal accidents resulting from falls. Almost a quarter of this number are serious incidents requiring admission to hospital for more than a day or involving a fracture or serious laceration.”

How do we fall?

Although falls can be categorised into trips, slips, stumbles or collapses, each one of us will fall in a quite unique way according to the circumstances. However, understanding the dynamics of falls is essential to the development of an effective and reliable fall detection system. The main types of fall are as follows:

The forward trip

In this type of fall, the instant we lose our balance we instinctively react by trying to protect ourselves against impact. Unfortunately, many older people have neither the speed of reaction nor the joint mobility to do much about it. Collision with the ground is most likely to result in head injuries. The consequences are potentially serious. The head has further to travel and could therefore be travelling very quickly at the moment of impact.

Some people first fall to their knees and then to the ground. This is called a two-stage fall. Although neither impact should be as large as the single blow received during a one-stage fall, the knees have little protection and can easily be damaged.

Backward falls

These are often caused by slipping and are more common in men than in women. The fall is often quicker than a forward fall because the slip may force the feet some way forward as the backward collapse continues. The back of the body, particularly the head, is most at risk of injury because it has less ‘natural’ padding than the front of the body.

Falls to the side

These can best be described as a forward fall where the body has turned through an angle of 90 degrees or less, usually at the waist. These turning motions can create large forces from the hips down to the knees which, on impact, can be amplified to dislocate joints and fracture bones.

Softening the impact

So why is it that some falls result only in minor bruising while others can have more serious and lasting effects? Contrary to popular belief, the height and weight of a person does not determine the level of injury. It is the impact that is most relevant. The lower the forces on impact, the less chance there is of serious injury. These forces are reduced if the impact time is fairly long because they are dispersed over time. Good thick carpets, suspended wooden floors and plenty of clothing can also absorb the impact force and reduce the risk of serious injury. A note of caution however; even the softest of landings can cause injury and should be detected. The next fall could be on a much harder surface like concrete and lead directly to serious damage.

“People aged over 65 account for almost half of the serious fall incidents and 20% of the minor cases.”

Making the home a safer place

Most accidents occur in the home. But there is much that can be done, quickly, easily and at relatively little cost, to reduce the risks of falling. Here is a list of useful “do’s and don’ts” that will go a long way towards making the home a safer place.

DO

- use a non-skid polish on waxed or polished floors
- attach non-slip backings or grippers to any small rugs
- ensure that all carpet edges are tacked or secured with gripper rods
- have a hand-rail installed on the stairs
- use a non-slip mat in the bath, shower and on the bathroom floor
- have a safety bar securely fitted above the bath
- keep soap and shampoo in a dish close to hand when bathing or showering
- replace any single level steps with a ramp wherever possible
- use a cordless telephone to avoid trailing phone wires
- keep small objects like bins out of the way – in a cupboard or under a table
- immediately pick up things that fall onto the floor
- wipe up any liquid spills before the floor becomes slippery
- put a bell on the collar of any pet dogs or cats so that they can be heard as well as seen

DON'T

- use mats at the top or bottom of stairs
- keep heavy items high up in cupboards
- leave chairs out from under the table
- have electrical cables running across the floor – have extra power sockets installed instead



Other ways to reduce the risks

Having taken the precautions of removing the obvious fall hazards in the home, there is still more that can be done to avoid accidents and potential injury. The risk of falling can be further reduced simply by exercising care, attention-to-detail and being aware of the dangers.

- take your time in answering the telephone or the door
- ensure stairs and landings are well lit. Using 100 watt instead of 60 watt bulbs has little effect on the electricity bill, but has a big impact on visibility
- ensure light switches are located close to every doorway and easily located in the dark
- switch on the bedside lamp before getting out of bed at night
- never walk around in socks or stockings on a polished floor
- if children are visiting, watch out for toys left on the floor
- when you carry bulky items, don't let them obstruct your vision
- don't lean forwards or backwards too far without holding onto something for support
- always use walking aids such as a stick, a frame or a trolley if you have one
- if you live in a two-storey house, have spare walking aids upstairs to avoid having to carry them up and down stairs
- wear your spectacles at all times if you have difficulty seeing objects without them
- look after yourself with a good diet, regular exercise and plenty of rest between activities
- make sure that your community alarm telephone system is available to you – this will boost your confidence immediately



“Of the people that die from falls, 80% of the victims are aged over 65 and only 5% are under the age of 40.”

Detecting falls

Removing hazards and taking the precautions described earlier will go a long way towards preventing a fall. But, no matter how much care we take, accidents can and do still happen. The priority then is to ensure the fall is detected so that help can be sent immediately.

The fall detection systems currently available can be divided into primary and secondary methods.

Primary methods are generally devices worn by a person, which react to the change in orientation and the impact consistent with any type of fall.

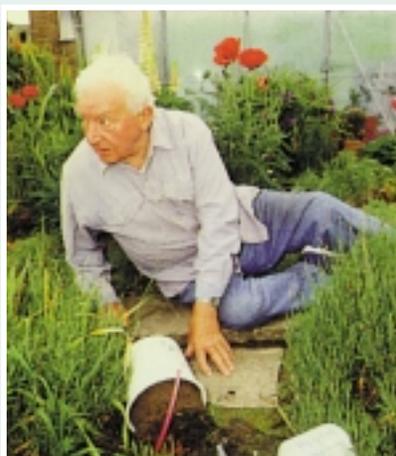
Secondary methods are devices built into the home environment. These systems typically analyse moving images or sound to detect a fall. However, cameras and thermal imaging equipment are intrusive and many people feel uncomfortable with the idea of being ‘watched’ in every room of their home. And sound-based systems are far from ideal for detecting falls on carpets and other soft surfaces.

For reliability and affordability, primary methods of fall detection are now widely recognised as the preferred solution. An added benefit is that they are always under the direct control of the wearer.

Early primary methods included the use of simple tilt-switches which triggered an alarm if the wearer stopped moving for long periods or bent over too far. Unfortunately the technique was not

foolproof and resulted in an unacceptable level of false alarms. However, technology has come a long way since then. One company leading the way in the development of a new generation of fall detectors is Tunstall.

The Tunstall detector successfully combines a high immunity to false alarms with sensitivity and reliability, providing the reassurance that any serious fall event will be detected. These are the essential qualities that make the Tunstall Fall Detector the ideal solution.



“Men and women are equally at risk of fatal falls. However, older women are twice as likely as men to have a serious but non-fatal fall.”

The Tunstall Fall Detector

The Tunstall Fall Detector is the first intelligent product of its kind and represents a major breakthrough in the swift and reliable detection of potentially serious falls. Designed by experienced bio-engineers, it is the culmination of years of research and development involving universities, local authorities, occupational therapists, physiotherapists and hundreds of volunteers.

The device itself is attractively styled whilst being small and light enough to be worn unobtrusively and safely by the wearer.

How does it work?

Unlike other systems, the Tunstall Fall Detector utilises an intelligent two-stage detection process. This two-stage activation process minimises false alarms and unambiguously identifies a genuine fall event. The Fall Detector wakes up from a sleep state when the impact sensor generates a signal that is greater than a predefined threshold. It then looks at the user's orientation through a second sensor. Only if the wearer is in a lying position does

the process continue. If this state is unchanged after 15 seconds, the device registers an emergency and sends a radio alarm signal to the Tunstall home unit, triggering a call for help to a Monitoring and Response Centre.

A combined multi-tone and two colour visual activation indicator reassures the wearer that the call for help is being made. The device also incorporates a panic button, enabling the wearer to raise an alarm manually.



How to use and wear the Tunstall Fall Detector

Following a few simple guidelines will ensure that the wearer maximises the performance and sensitivity of the Fall Detector.

Firstly, although small enough to be carried ready for use in a handbag, wallet or purse, the Fall Detector must be worn on the body if it is to detect a fall.

Secondly, the device must be worn where it will receive the shock associated with a fall. Whilst there is no specific ideal location for the detector, it should always be worn at or above the waist. Conversely, research has shown that the only location that should be strictly avoided is the wrist.

Thirdly, the Fall Detector must be worn where it will assume the inclination of the body following a fall. Provided the device is fixed to clothing at or above the waist, it will measure the body's inclination within an acceptable tolerance of 10 to 15 degrees and will detect more than 90% of all falls onto a horizontal floor.

If an alarm call is not automatically triggered immediately following a fall, this will often be because the fall is incomplete. An example is when a slump to the ground is interrupted by an item of furniture or the stairs. Under these circumstances, the Fall Detector would be activated by the impact but may not sense that the person has fallen to the ground. In most instances, failure to activate is only momentary and when the fall is subsequently completed it would be fully detected.

Even in the unlikely event that the Fall Detector is not automatically activated, the

wearer can use the manual alarm button on the device to call for help.

Where best to wear the Fall Detector

The Fall Detector is supplied with a simple plastic clip for comfortable and easy attachment to clothing. The best location for wearing the device is about the waistline so that the detector remains upright when the wearer is in a sitting position. However, it is an individual choice and different locations may be more appropriate to different users, depending on their size and other physical characteristics.

Please note though that some locations may make the device more sensitive and therefore more prone to false alarms while other locations might, under extreme circumstances, fail to register some types of falls. It really is a case of testing and experimenting to find the ideal location for you.



Part of a reassuringly complete package

Used in conjunction with a modern Tunstall community alarm system and monitored by a Tunstall 24 hour Control Centre, the Fall Detector offers total reassurance. When a call is activated by a fall, the Control Centre operators will know immediately where the call was initiated, the identity of the client, their case history and who to contact to provide help.

In all cases the operator will try to talk to the caller to ascertain the nature of the problem. In the case of an automatic fall detector there are only two possible explanations for a call – a false alarm or the client has fallen.

If a fall has indeed occurred, the client may need immediate attention and, perhaps, a reassuring visit from a relative or even the help of emergency services. In most cases the client will be shaken but able to get back to their feet. Even so, it is important that the cause of the fall is quickly established and appropriate steps are taken to prevent a repeat.

False alarms should be considered just as seriously. The most common cause of false alarms is that the Fall Detector is being worn or handled incorrectly. In cases like these, the client may well require additional guidance and further instruction on how to wear and use the product.

About one-third of the UK's 12 million retired population experience at least one fall every year. Two-thirds of these will fall again within 6 months. Perhaps half of all falls in older people will result in minor soft tissue damage, but between 10 and 15% will cause some serious physical injury.

Anything that can dramatically reduce not only the risk of falling and its consequences, but also the fear of falling must be of enormous benefit and reassurance to those who are most vulnerable. The wearing of a fall detector is therefore a crucial element in any fall prevention strategy.

The Tunstall Fall Detector offers a discreet, reliable and cost-effective solution that can be linked to established community alarm systems in an integrated programme of fall prevention.

Further reading

A wealth of information exists in academic papers and books throughout the world on how falls incidence can be reduced by appropriate intervention and training. Falls are a scourge of older people, leaving many in fear of being hospitalised or even left to die. As such it is a priority item on the agenda of health and social care agencies who are often left with the task of helping people to rebuild their lives after sustaining serious fractures as a result of falling.

- **Preventing Patient Falls**
by Janice M. Morse,
Sage Publications (1997)
- **Content Validity of an Assessment Tool to Identify Home Fall Hazards: the Westmead Home Safety Assessment**
by L. Clemson et al;
British Journal of Occupational Therapy; Vol. 62 No. 4 Pages 171-179 (1999)
- **Falling in Older People at Home: Transfer Limitations and Environmental Risk Factors**
by D. McLean
Australian Occupational Therapy Journal; Vol. 43 No. 1 Pages 13-18 (1996)
- **Prevention of Falls in the Elderly Trial (PROFET): A randomised controlled trial**
by J. Close et al
Lancet Vol. 353 pages 93-97 (1999)
- **Primary and Secondary Sensing Techniques for Fall Detection in the Home**
by K Doughty et al
Hospital Without Walls Conference, City University, London, March 24-26 (1999)
- **Prevention of Falls in the Elderly**
by MM Guelich et al
Topics in Geriatric Rehabilitation Vol. 15 No. 1 pages 15-25 (1999)
- **Interventions to Reduce the Incidence of Falling in the Elderly**
by LD Gillespie et al
The Cochrane Library (Oxford) Issue 1



Protection

Protection 1. care, charge, defence, guardianship, guarding, protecting 2. safeguard, safekeeping, safety, security.

All the reassurance you need

Tunstall

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If you would like any additional information on any Tunstall product or service, or would like more copies of this booklet, please call our Telehealth advice line on

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