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Severe Adverse Weather Plan: Heatwave

Introduction and Aim

This plan has been developed to assist managers and staff to deal with a heat wave event that impacts on the normal operating (business continuity) of the Cardiff and Vale University Health Board (CVUHB) and its community.

The aim of this plan is to enhance resilience in the event of a heat wave and to reduce the risks to health associated with extreme heat by alerting health, social and other care agencies and members of the public (especially vulnerable groups) to the dangers of excessive heat.

Objectives

- Collaborating with the South Wales Local Resilience Forum (SWLRF) to ensure the community risk register adequately reflects risk to human health.
- Working with key partner agencies to communicate and minimise the risks to the public and wider community.
- Support the development of strong working links with the media so that advice and information can be communicated promptly both before, and during, a heat wave
- Support co-ordination amongst social and health care agencies to provide appropriate care to the CVUHB catchment population during heat wave conditions
- Maintain effective business continuity management arrangements to minimise the risks to patient's safety.
- Maintaining effective business continuity management arrangements to minimise the risks to staff health, safety and welfare.

Scope

This procedure applies to all of our staff in all locations including those with honorary contracts

Equality Health Impact Assessment	An Equality Health Impact Assessment (EHIA) has been completed. The Equality Impact Assessment completed for the policy found here to be a no impact.
Documents to read alongside this Procedure	• Emergency Pressures Escalation Plan • Clinical & Service Board Business Continuity Plans • Major Incident Plan
Approved by	Emergency Preparedness Resilience and Response (EPRR) Strategic Overview Group.
Accountable Executive or Clinical Board Director	Executive Director of Strategic Planning
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Disclaimer

If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or the Governance Directorate.

Summary of reviews/amendments

Version Number	Date of Review Approved	Date Published	Summary of Amendments
1	02/06/2011	28/06/2011	To be formally approved by Operational Board of Directors Committee
2	14/12/2011	27/02/2012	No longer Interim
3	02/08/2012	07/09/2012	Minor amendment - colour code on the alert process used by the Meteorological Office.
4	15/01/2015	29/01/2015	Aims enhanced to reflect multi agency cooperation and resilience. Clarifies Civil Contingency Act (2004) requirement to pre identify vulnerable groups, and promote partnership working with other category 1 and 2 responders in advance of a heat wave. Specific roles and responsibilities have been identified. Identifies hazards to infrastructure and the requirement of Capital Planning teams to “design out” risks associated with excessive heat. Control and command structure aligned to UHB Major Incident Plan. Specific trigger points for activation of function Gold command clarified.
5	15/07/2019		Updated temperature threshold definitions. Referenced introduction of Business Continuity Policy and role of Chief Operating Officer.

			Modified Gold commander from Nurse Director to less prescriptive Executive Director role title. Amended reference to “Heat Health Alert Watch” as system alerts no longer supported by Public Health Wales. Enhanced Appendix 4 to include specific actions for individual post holders. Removed Appendix 5 – Communication flowchart. Inserted Appendix 6 - A guide to looking after yourself and others
06	11/09/2022	05/12/2022	Greater reference to climate change and potential for new legislation. Addition of telephone contact number for Meteorological Office.

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1. Purpose

This plan has been developed to assist managers and staff to deal with a heat wave event that impacts on the normal operating (business continuity) of the Cardiff and Vale University Health Board (CVUHB) and its community.

Provisional figures show the summer of 2022 - covering June, July and August - had an average temperature of 17.1C. This toed with 2018 for the warmest, according to records stretching back to 1884.

It means four of the five warmest summers on record have happened since 2003, as the effects of climate change are felt on the nation's summer temperatures.

Research shows that climate change is making these events more likely. A scientific study by the Meteorological Office into the Summer 2018 heatwave in the UK showed that it was 30 times more likely to occur now than in 1750 because of the higher concentration of carbon dioxide (a greenhouse gas) in the atmosphere. As greenhouse gas concentrations increase heatwaves of similar intensity are projected to become even more frequent, perhaps occurring as regularly as every other year. The Earth’s surface temperature has risen by 1°C since the pre-industrial period (1850-1900).

Climate change will increase the frequency and the intensity of heat waves, and a range of measures, including improvements to hospital designs, management of chronic diseases, and institutional care of the elderly and the vulnerable, will need to be developed to reduce health impacts.

The Climate Change Act 2008 now makes it a requirement for all statutory sectors, including the health sector, to have robust adaptation plans in place. Climate Change Act 2008 is up to date with all changes known to be in force on or before 11 September 2022. There are changes that may be brought into force at a future date

2. Scope

The plan forms part of the Health Board’s strategy for minimising the risk to its business and its statutory duty to comply with the requirements of the Civil Contingencies Act 2004.

The development of this plan has been based upon the findings of the risk assessments as set out in the South Wales Local Resilience Forum (SWLRF) Community Risk Register, in conjunction with “lessons identified’ from past severe weather events.

This plan should be read in conjunction with the Heat wave Plan for Wales (2012), the UHB Business Continuity Policy and the Major Incident Plan.

3. Aims & objectives

The aim of this plan is to enhance resilience in the event of a heat wave and to reduce the risks to health associated with extreme heat by alerting health, social and other care agencies and members of the public (especially vulnerable groups) to the dangers of excessive heat.

Concurrently, to maintain either the normal business of the Health Board, or an acceptable level of business wherever reasonably practicable, and to support the community in reducing the impact of a heatwave. This will be achieved through meeting the following objectives: -

- *Collaborating with the South Wales Local Resilience Forum (SWLRF) to ensure the community risk register adequately reflects risk to human health.*
- *Working with key partner agencies to communicate and minimise the risks to the public and wider community.*
- *Support the development of strong working links with the media so that advice and information can be communicated promptly both before, and during, a heat wave*
- *Support co-ordination amongst social and health care agencies to provide appropriate care to the CVUHB catchment population during heat wave conditions*
- *Maintain effective business continuity management arrangements to minimise the risks to patient's safety.*
- *Maintaining effective business continuity management arrangements to minimise the risks to staff health, safety and welfare.*

4. Definition

The temperature threshold for declaring an extreme heat condition or heat wave warning is a period of weather that continues for at least 3 days where the daily maximum temperature is 25 Celsius or more.

5. Roles and responsibilities

Chief Executive

The Chief Executive has overall accountability for ensuring that the UHB can respond to the "*Heatwave Plan for Wales*". He is also responsible for ensuring that Meteorological Office adverse weather alerts are effectively communicated throughout the organization.

In the course of routine business, the responsibility for information cascade to Clinical Board triumvirates is delegated to the Head of EPRR.

Executive Directors (on call)

a) Be familiar with the "Heatwave Plan for Wales" and its requirements.

b) Executive Directors must ensure that they provide the necessary support and advice to the senior manager on call and clinical staff, if required.

c) Be prepared to convene and chair a strategic (Gold) command meeting if a level 4 alert (Major Incident) is issued.

Chief Operating Officer

a) Be fully conversant with the "Heatwave Plan for Wales" and its requirements.

b) Be prepared to lead on Business Continuity at alert level 3 and Recovery (Gold) component if a level 4 alert is issued (Major Incident).

c) Customarily support long term service planning to mitigate the effects of adverse weather on the UHB and its resources.

d) Direct and support Clinical Board triumvirates to develop systems to identify and improve resilience of high-risk individuals.

e) Promote the development of business continuity plans to ensure robust systems are in place to cope with extreme temperatures, which might result in power or water shortages to UHB premises and impact upon clinical services.

f) Verify surge plans are up to date and aligned with current Clinical Board bed stock and capacity.

Clinical Board triumvirates

a) Be familiar with the "Heatwave Plan for Wales" and its requirements.

b) Ensure that they develop, implement and monitor a system within their area of responsibility for the rapid dissemination of Heat wave alerts to their staff, paying particular attention as to when key people are absent.

c) Ensure that they develop, implement and monitor a system within their area of responsibility which provides assurance that measures commensurate with the alert levels are undertaken, and that business continuity is maintained.

d) Under the guidance of the Chief Operating Officer the Tactical (Silver) incident control center will also be used to coordinate serious business continuity challenges (level 3 alert).

e) Under the guidance of the Executive Director (Gold) the Clinical Board Triumvirate will lead the Tactical (Silver) UHB response in the event that a Major Incident is called.

f) Under the guidance of the Chief Operating Officer the Tactical (Silver) incident control center will also be used to coordinate serious business continuity challenges (in the absence of Major Incident declaration).

g) Make sure that Situation Reports are produced (as required) and submitted at agreed frequencies.

Lead Nurses / Heads of Department / Service team leaders

a) Ensure they are fully conversant with the with the Clinical Board plan for implementing the information cascade.

b) Confirm that existing and new staff are aware of this policy, and their responsibilities.

c) Develop a business continuity plan that recognises that a severe heat wave may result in higher than usual levels of staff absenteeism. Combined with summer holidays, this may create difficulties in maintaining essential services.

d) Establish operational systems to ensure that the appropriate action, as described in the alert, is taken.

e) Routinely prompt reporting of adverse events through the appropriate channels and ensure that all necessary investigations are completed.

f) Provide assurance that local action is taken as necessary to pre identify vulnerable patient groups.

g) Guarantee all necessary actions are taken to ensure the safety of patients, relatives and staff.

h) Ensure that out of hours, weekends and Bank Holidays that Ward/Team Managers receive alerts by checking the Met Office website and local media reports daily.

i) Ensuring a consistent UHB and Public Health Wales message is conveyed to patients, staff and relatives. Remain mindful that email can an ineffective form of communication for frontline staff and you may

need to consider testing other modes of communication, particularly looking into the value of instant messaging services and social networking websites.

Primary care services and General Practitioners
It is recommended by the World Health Organisation (Heat Health Action Plan 2008) that General Practitioners include pre-summer medical assessment and advice in routine care, including on fluid intake, weight changes and medication relevant to heat (see appendix 1).This principle should be applied to all community based clinical teams.

6. Hazards to human health

Cities and urban areas tend to be hotter than rural areas, creating urban heat island effects (see appendix 2). This is due to increased absorption and reflection of the sun on concrete compared with green or brown spaces; reduced cooling from breezes due to buildings; and increased energy production from houses, industry, businesses and vehicles.

High temperatures are also linked to poor air quality with high levels of ozone which are formed more rapidly in strong sunlight; small particles (PM10s) also increase in concentration during hot, still air conditions. Both are associated with respiratory and cardiovascular mortality. Additionally, there may be increases in sulphur dioxide emissions from power stations due to an increase in energy use for air-conditioning. Sulphur dioxide worsens symptoms of asthma.

People gradually adapt to changing temperature trends. Therefore, heatwaves are a relative experience, affecting different people in different ways. The human body responds to heat in a number of different ways. When the ambient temperature is higher than skin temperature, the body regulates its temperature by losing heat through sweating. So, any factor that reduces the body's effectiveness of sweating such as dehydration, lack of breeze, or tight fitting clothing can cause the body to overheat.

Additionally, thermoregulation, which is controlled by the hypothalamus, can be impaired in the elderly and the chronically ill, and potentially in those taking certain medications, rendering the body more vulnerable to overheating. Young children produce more metabolic heat, have a decreased ability to sweat and have core temperatures that rise faster during dehydration. During previous heat waves death rates have been noted to increase in particular for those with renal disease. A peak in homicide and suicide rates during previous heat waves in the United Kingdom has also been observed.

Some people are at particularly high risk during a heat wave. These include

- Older people - especially those over 75 years old and living alone
- People living in residential care or nursing homes

- People who have a history of self-neglect
- People with an already raised temperature from infection
- People with underlying suffering from mental ill health
- Those who rely on help from other people to manage day-to- day activities
- Immobile, bed-bound, or taking certain types of medication
- Suffering from chronic ill health, i.e. Respiratory or cardiac conditions
- Those known to have previously experienced problems in adapting to extreme heat
- People dependent upon excessive alcohol or illicit drugs
- Babies and young children, especially under four years old.

In a moderate heat wave, it is mainly the high-risk groups mentioned above who are affected. However, during an extreme heat wave such as the one affecting France in 2003, normally fit and healthy people can also be affected.

6.1 Symptoms of excessive heat exposure

In a severe heat wave the body can overheat and dehydrate quickly, leading to heat exhaustion or heat stroke. The main causes of illness and death during a heatwave are respiratory and cardiovascular diseases. Additionally, there are specific heat-related illnesses including:

Heat cramps– caused by dehydration and loss of electrolytes, often following exercise.
Heat rash – small, red, itchy papules.
Heat oedema – mainly in the ankles, due to vasodilation and retention of fluid.
Heat syncope – dizziness and fainting, due to dehydration, vasodilatation, cardiovascular disease and certain medications.
Heat exhaustion – is more common. It occurs as a result of water or sodium depletion, with non-specific features of malaise, vomiting and circulatory collapse, and is present when the core temperature is between 37ºC and 40ºC. Left untreated, heat exhaustion may evolve into heatstroke.
Heatstroke – can become a point of no return whereby the body's thermoregulation mechanism fails. This leads to a medical emergency, with symptoms of confusion; disorientation; convulsions; unconsciousness; hot dry skin; and core body temperature exceeding 40ºC for between 45 minutes and eight hours. It can result in cell death, organ failure, brain damage or death. Heatstroke can be either classical or exertional (e.g. in athletes).

Heatstroke can develop if heat exhaustion is left untreated but can also occur suddenly and without warning. It can result in irreversible damage to the body, including the brain, or in the most severe cases, death.

6.2 Conditions which increase the risk of dying in a heat wave

Virtually all chronic diseases present a risk of death/illness due to heat and, since the elderly are more likely to have a chronic medical condition, this is another reason why they are at increased risk.

There are several reasons why people with chronic diseases are at increased risk during heatwaves (see also Table 1).

- Any disease that leads to an inability to increase cardiac output, such as cardiovascular disease, will increase the susceptibility to heatstroke and/or cardiovascular failure and death, as thermoregulation during severe heat stress requires a healthy cardiovascular system.

- Peripheral vascular disease, often caused by diabetes or atherosclerosis, may increase the risk of severe heat illness, as it may be hard to increase the blood supply to the skin.

- Diarrhoea or febrile illness, particularly in children, and pre-existing renal or metabolic diseases may increase the risk of heat-related illness and death because these may be associated with excessive fluid loss and dehydration.

- Chronic diseases which affect the number and/or function of sweat glands, such as diabetes, scleroderma and cystic fibrosis, can increase the risk of hyperthermia and heatstroke.

- Any disease or condition that confines someone to bed and reduces their ability to care for themselves or to leave home daily also increases the risk. This is because of a general reduction in the ability to make an appropriate behavioural response to heat.

Table 1

Diabetes mellitus, other endocrine disorders
Organic or mental disorders, dementia, Alzheimer's (mild, moderate, severe)
Mental and behavioural disorders due to psychoactive substance use, alcoholism
Schizophrenia, schizotypal and delusional disorders
Extrapyramidal and movement disorders (e.g. Parkinson's disease)
Cardiovascular disease, hypertension, coronary artery disease, heart conduction disorders
Diseases of the respiratory system, (COPD, bronchitis)
Diseases of the renal system, renal failure, kidney stones

Note. This table only addresses chronic (long-term conditions) and not acute diseases. Infections, fever, gastroenteritis and skin infections are also risk factors for heat-related mortality. *(Source*: adapted from Kovats & Hajat, in press).

Medications can also aggravate heat illness. For example, vasodilators, such as nitrates and calcium channel blockers, can theoretically cause low blood pressure in people who tend to be dehydrated during excessive heat exposure, particularly the elderly. Dehydration and changes in blood volume distribution can also increase medication toxicity and/or decrease the efficacy by influencing drug levels, drug kinetics and excretion and, hence, the pharmacological activity. This includes drugs with a narrow therapeutic index.

Finally, storage of drugs at high ambient temperatures can adversely affect their efficacy, as most manufactured drugs are licensed for storage at temperatures up to
25 °C. This is particularly important for emergency drugs used by practitioners including antibiotics, adrenalins, analgesics and sedatives.

6.3 Reducing the risk

The Civil Contingency Act requires the UHB to work in partnership with local authorities and social care services to identify vulnerable populations to target long-term planning and interventions. Consequently, all service managers must routinely take steps to ensure that vulnerable groups in their care are pre identified as "*at risk*".

This is an essential step to ensuring patient welfare during adverse weather – be it heat wave, severe cold and snow or flooding. Such information would prove invaluable to partner agencies during a civil emergency. Examples being Natural Resources Wales and the Fire and Rescue Service during flooding; or water supply companies at time of drought. Well in advance of the summer months the Health Board and local authorities should review what support primary care, community and other care staff can provide to selected groups of individuals.

As seasons change service managers should routinely monitor weather forecasts in order to obtain advanced warning of any impending adverse weather conditions. This will allow time to review existing care plans in order to assess which individuals are at particular risk, and to identify what extra help they might need in a proactive manner. Consider extra help, where available, from social care services, the voluntary sector, families and others to care for those most at risk. This will be pre-determined locally as part of individual care plans and will be based on existing relationships between statutory and voluntary bodies. This support may include:

- identifying individuals who are at particular risk from extreme heat. Many of these people are likely to already be receiving care;
- identifying and implementing necessary changes to individual care plans for those in high-risk groups, including initiating daily visits by formal or informal carers to check on people living on their own;
- check that the person can contact the primary care team if one of their informal carers is unavailable;
- confirm business continuity arrangements for external companies commissioned to provide services on behalf of the UHB;
- working with families and informal carers of at-risk individuals to raise awareness in respect of the dangers of heat, how to keep cool and put in place simple protective measures e.g. installing appropriate ventilation and ensuring fans and refrigerators are available and in good working order;
- reviewing surge capacity and the need for, and availability of, suitably trained staff support in the event of extreme heat conditions or heatwave, especially if over a prolonged period;
- where individual households are identified as being at particular risk from hot weather, a request can be made to local authority Environmental Health professionals to undertake an assessment using the Health Housing and Safety Rating System. The Health Board can work actively with the local authority lead on the Housing Health and Safety Rating System (HHSRS) to identify and assess those considered most vulnerable during heatwaves (see appendix 3).

Additional practical actions to consider during a period of increased temperatures include:

- ✓ Check patients body temperature, heart and breathing rates, blood pressure and hydration levels at a minimum of 4 hourly intervals
- ✓ Observe for any changes in behaviour, especially excessive drowsiness
- ✓ Watch for signs of headache, unusual tiredness, weakness, giddiness, disorientation or sleeping problems – and have a plan to address these symptoms.
- ✓ Place a thermometer in the clinical inpatient area or client's home to keep a check on the temperature.
- ✓ Turn off non-essential lights and electrical equipment – they generate heat
- ✓ Ensuring south facing windows have blinds or curtains.
- ✓ Keep windows that are exposed to the sun closed during the day, and open windows at night when the temperature has dropped
- ✓ Keep rooms well ventilated
- ✓ Persuade people to stay out of the sun between 11am and 3pm
- ✓ Adjust therapy schedules to occur outside 11am and 3pm if possible

- ✓ Consider moving patients to cooler area if necessary – even for part of the day / night. (This will require advanced planning in secure areas e.g. mental health)
- ✓ Cool areas must be kept at a temperature of no more than 25°C
- ✓ Ensure the ongoing free provision of cool drinks
- ✓ Where possible and in compliance with the patient care plan consider adapting menus to cold meals – encouraging salads and fruit (preferably with a high water content)
- ✓ Discourage caffeine (coffee, tea, colas), very sweet drinks and alcohol
- ✓ Check fans and / or air-conditioning devices are available and in good working order
- ✓ Advise them to wear light, loose, cotton clothing
- ✓ Facilitate a cool shower, bath or body wash
- ✓ Consider the requirement for possible changes in medication
- ✓ Identify any extra help, care or support needed
- ✓ Arrange additional welfare visits for those who live alone or live with an elderly or disabled relative
- ✓ Consider postponing non-emergency surgery
- ✓ Confirm bed availability especially in emergency departments
- ✓ Increase medical care staff to ensure full coverage in case of an increase in admissions
- ✓ Consider moving Hospital visiting hours to mornings and evenings to reduce afternoon heat from increased numbers of people
- ✓ Ensure that discharge planning considers the vulnerability of the patient to high temperatures and the accommodation they will be going back to.

Considerations must also include actions to protect staff. To include:

- ✓ Consider amendment to staff uniform to minimise discomfort. If safe to do so allow staff to wear light, loose-fitting cotton clothes;
- ✓ Factor in addition rest periods for staff and ensure that they avoid extreme physical exertion. This may necessitate additional staff on rotas;
- ✓ Ensure free access to a cold water supply.

7. Hazards to infrastructure

Preparations for dealing with the effects of adverse weather will inevitably concentrate on the preservation of life. However, it is essential that the UHB have plans in place to ensure the reliability and safety of the infrastructure which supports core services.

Heat waves sometimes cause power outages that can threaten the welfare of individuals, who depend on lighting, cooling systems, medical equipment, alarms and other electronically powered systems or devices. Laboratories,

pharmaceutical storage and food storage areas in hospitals may be adversely affected by increasing temperatures. Most pharmaceutical products are heat sensitive and start to degrade if stored at higher than room temperature (usually 25ºC).

In addition, there is a potential for information technology servers to overheat and cause disruption to email communication or electronic patient records – this may occur in both primary and secondary care settings. In preparation for adverse weather managers will need to collaborate with support services to assess the resilience of equipment to ensure that it can be maintained at working temperatures and that there is no risk of failure through overheating.

In the medium term (10 plus years) UHB Capital Planning teams will need to focus on building hospitals and primary care facilities to aid passive cooling where possible, and target vulnerable areas (inpatients, medications, IT) with air-conditioning. Welsh Government offer additional guidance on cooling hospital estates as follows:

- Create cooling green spaces in the surrounding environment, with trees, shrubs, trellises, arbours, climbers, green roofs and water features.
- Do not extend car parks at the expense of green spaces – this adds to surrounding heat. Introduce an active transport plan. Plant trees around existing car parks and on top of multi-storey car parks.
- Ensure buildings are well insulated – both loft and cavity insulation helps to reduce heat buildup, (and also reduces carbon emissions and increases energy efficiency).
- Increase opportunities for night-time ventilation either through vents or windows.
- For south-facing windows, consider external shading or reflective glass, reflective paint may help on south-facing walls.

8. Information/Alerts

In recent years the ability to forecast severe weather events has become more accurate. This advance has allowed organisations to plan for these events and ensure that adequate arrangements are in place to minimise the risk to health.

In addition, you can monitor the current situation by checking on the internet (www.metoffice.gov.uk) or listening to local weather news. It is important to ensure a consistent message and to make sure you know what advice to give people at risk. Public information is available from Age Concern Cymru, NHS Direct Wales and from the Chief Medical Officer Wales website

Collaborative epidemiological surveillance arrangements will allow trends in heat-related morbidity and mortality to be tracked and monitored and facilitate the evaluation of intervention effectiveness.

Once the alerts are received by personnel within the UHB it is the responsibility of managers to:

- Cascade the information to all staff groups – especially frontline units;
- Ensure that suitable arrangements are in place to mitigate effects of heat;
- Minimise the risk to the business, health, safety and welfare of both patients, staff and the community;
- Utilise contacts with Regional media teams and the UHB social media sites to issue alerts about keeping cool.

Communication with the Meteorological Office, Public Health Wales and UHB intra-managerial communication will be coordinated by the EPRR Team. However, it is the responsibility of Clinical Board triumvirates to ensure the alerts cascade to frontline staff.

All staff have a responsibility to ensure that they understand this plan and are also expected to follow any safety advice issued.

If patients / families / carers are seeking advice Appendix 6 - A guide to looking after yourself and others – can be printed and distributed accordingly.

9. Alert levels

The heatwave alert levels will be triggered by temperature thresholds in the Heatwave Plan for Wales set according to regional variations. Therefore the Met Office website www.metoffice.gov.uk (Tel: 0870 900 0100) will be the first place to display these alert levels. The alert level will also subsequently be displayed on the Welsh Government, Public Health Wales and NHS Direct Wales websites.

The Meteorological alert system comprises of four levels:

Level 1 (GREEN) **Business as usual**	**Summer preparedness and long-term planning.** This is the minimum state of vigilance during the summer. During this time social and healthcare services will ensure that all awareness and background preparedness work is ongoing.
Level 2 (YELLOW) **Heightened vigilance**	**Alert and Readiness** Triggered as soon as the risk is 60% or above for threshold temperatures being reached in one or more regions on at least two consecutive days and the intervening night.
Level 3 (AMBER) **Business Continuity Incident declared**	**Heat wave Action** Triggered when the threshold temperatures for one of more regions have been reached for one day and the following night, and the forecast for the next day has a greater than 90% confidence level that the day threshold temperature will be met.
Level 4 (RED) **Major Incident declared**	**Major Incident – National Emergency Response** Reached when a heatwave is so severe and/or prolonged that its effects extend outside the health and social care system.

The response levels required to these alerts are described in detail in appendix 4. The alert system is based on threshold day and night-time temperatures as defined by the Meteorological Office. A period of weather that continues for at least 3 days where the daily maximum temperature is 25°C or more is considered as an extreme heat incident.

10. Communication and Coordination

Many of the approaches to planning for and responding to heat-waves draw on generic emergency planning models. As a rule, creating new systems runs the risk that lessons learnt elsewhere will not be applied and, in crises, tried

and tested command and control mechanisms work best. Therefore, it is advisable to use existing local, regional and national systems for emergency response in the planning and response phases of heat-waves.

Nearly all emergency plans require a multiagency and intersectoral approach, and this is also the case for heat-waves. While many of the actions fall to the health sector, active involvement of other sectors is essential. All partners within the SWLRF can and will be of assistance at this time. When a forecast heat wave, or unpredicted event is realised, the overall response must be coordinated. The following principles will apply when planning for an imminent event and the subsequent UHB response;

- Within the UHB alert levels 1 and 2 will be subject to normal reporting mechanisms.

- Level 3 will be dealt with as a serious Business Continuity incident with Strategic leadership provided by the Chief Operating Officer. Tactical (Silver) Incident Control Centre will be activated at this stage.

- Level 4 will trigger a Major Incident and the Strategic Gold Command Incident Centre will be activated and led by Chief Executive / Executive Director. This will in turn activate all communication cascades and control and command structures as outlined within the UHB Major Incident Plan.

  Externally this will trigger a multiagency Strategic Command Group (SCG) at Police Headquarters. The UHB will be represented by the Strategic Civil Contingency manager, and an Executive Director.

- Operational (Bronze) management will be provided in each directorate and will coordinate the deployment of resources and monitor the welfare of patients and staff.

- All service managers are responsible for maintaining the routine business of the Health Board and for the welfare of staff. They must report any potential or actual business disruption to the Lead Nurse / Therapist immediately and provide advice on any corrective action being planned / implemented.

11. Training

Following document approval, the Plan will be posted on the UHB Intranet Site. No formal training sessions will be facilitated.

12. Post incident

A structured debrief will be organised after each heat wave and mangers/staff will be invited to attend to feed back on the response and identify any areas for improvement to this plan and future responses.

Appendix 1 A proactive approach by GPs - Bouchama A (2007)

Doctors should:

• understand the thermoregulatory and haemodynamic responses to excessive heat exposure;

• understand the mechanisms of heat illnesses, their clinical manifestations, diagnosis and treatment;

• recognize early signs of heatstroke, which is a medical emergency; and initiate proper cooling and resuscitative measures;

• be aware of the risk and protective factors in heat-wave-related illness;

• identify the patients at risk and encourage proper education regarding heat illnesses and their prevention; education of guardians of the old and infirm and infants is also important;

• include a pre-summer medical assessment and advice relevant to heat into routine care for people with chronic disease (reduction of heat exposure, fluid intake, medication);

• be aware of the potential side-effects of the medicines prescribed and adjust dose, if necessary, during hot weather and heat-waves;

- make decisions on an individual basis, since there are – according to current knowledge – no standards or formal advice for alteration in medications during 0hot weather;

• be aware that high temperatures can adversely affect the efficacy of drugs, as most manufactured drugs are licensed for storage at temperatures up to 25 °C; ensure that emergency drugs are stored and transported at proper temperature;

• be prepared to monitor drug therapy and fluid intake, especially in the old and infirm and those with advanced cardiac diseases.

Education and counselling of patients

Advice to patients should stress the importance of adhering to the recommendations spelt out in the leaflet for the general public. In addition, individual adjustments of behaviour (particularly for patients with chronic diseases), medication and fluid intake may be necessary according to clinical status. Contact details of social and medical services, helplines and emergency services should be made available.

Appendix 2

Urban Heat Islands

During a heatwave it is likely to be hotter in cities than in surrounding rural areas, especially at night. Temperatures typically rise from the outer edges of the city and peak in the center. This phenomenon is referred to as the 'Urban Heat Island' (UHI) and its impact can be significant. In London during the August 2003 heatwave, the maximum temperature difference between urban and rural locations reached 9ºC on occasions. A range of factors vary between rural and urban areas and contribute to the UHI – for example:

• **Thermal properties** of building and road materials, the height and spacing of buildings and air pollution levels. These factors result in more of the sun's energy being captured, absorbed and stored in urban surfaces compared to rural surfaces during the day and a slower loss of this energy at night, thus resulting in comparatively higher air temperatures.

• **Less evaporation and shading**, with the consequent reduction in associated cooling, taking place in the typically drier urban areas as there is less vegetation.

• **Greater inputs of heat** as a result of the high density of energy use in cities. All this energy, for example from buildings and transport, ultimately ends up as heat.

Strategic planning is therefore required which takes account of the above factors, particularly in the context of climate change. At a local scale these include the modification of surface properties, for example 'cool roofs', 'green roofs' and 'cool pavements'. Planting trees and vegetation and the creation of green spaces to enhance evaporation and shading are other options, as temperatures in and around green spaces can be several degrees lower than their surroundings.

Appendix 3 Housing health and safety rating system (HHSRS)

This is the way in which local housing authorities assess homes under the Housing Act 2004. It is the basis for regulation of housing conditions. Anyone, including health professionals, can request that an assessment be made if they have concerns about how housing conditions could potentially affect someone's health.

The assessment is usually made by an Environmental Health practitioner in the local housing authority. Judgement as to the risk is made by reference to the vulnerable age group for the hazard arising from deficiencies identified on inspection regardless of who is actually living there (for excess heat this is people aged 65 years or over).

There are 29 potential hazards in the system: these include excess cold, *excess heat*, damp and mould, lead, carbon monoxide, noise, entry by intruders, falls associated with baths, falling on stairs, falling on the level, fire, electrical hazards, and crowding and space.

Depending on the severity of the hazards found, the housing authority can require that a person (including landlords) takes action to reduce the hazard; alternatively, the assessment can be used as a basis for housing renewal assistance, e.g. grants or loans. For the most serious of hazards (Category 1) there is a duty on the authority to take action

Appendix 4 Alert levels and detailed actions required

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
UHB status	**Business as usual** **Summer preparedness and long-term planning**	**Heightened vigilance** **Alert and readiness**	**Business Continuity Incident declared** **Heatwave action plan**	**Major Incident declared** **National emergency response**
Command structures	Normal reporting	Normal reporting	Tactical (Silver) Incident Control Centre activated	Strategic (Gold) Incident Command Centre activated
Responsible Officer	Normal reporting	Normal reporting	Chief Operating Officer	Chief Executive / Executive Director
Implications	This is the minimum state of vigilance during the summer. During this time social and healthcare services will ensure that all awareness and background preparedness work is ongoing.	60% risk of a Heat wave in 2 - 3 days' time. This is an important stage for social and healthcare services who will be working to ensure readiness and swift action to reduce harm from a potential heatwave.	Trigger temperatures have been reached in one or more Regions. This stage requires social and healthcare services to target specific actions at high-risk groups. Ensure that high risk patients are carefully	Heatwave is so severe and/or prolonged that its effects extend outside health and social care, such as power or water shortages, and/or where the integrity of health and social care systems is threatened. Illness and death may occur among the fit and healthy,

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
			monitored in accordance with pre-determined care plans.	not just in those at-risk individuals, and will require a multi-sector response at national and regional levels.
Roles and responsibilities				
Chief Executive (CEO)	Business as usual.	Business as usual.	Once this level is reached a Business Continuity Incident will be declared and the UHB Command and Control structures will be activated at operational (Bronze) and Tactical (Silver) level. Watching brief from COO. Be prepared to activate Strategic (Gold) incident command centre. Be prepared to convene and chair a strategic (Gold) command meeting if the situation deteriorates.	Once this level is reached, a 'major incident' is declared and all existing national and local emergency policies and procedures will apply. Formally cascade confirmation that Major Incident has been declared. Attend UHB Strategic (Gold) incident command centre. Chair / nominate Executive Director to Chair UHB Strategic (Gold) meeting. Be prepared to attend multi agency Strategic Command

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
				Centre or the Emergency Coordination Centre -Wales (ECCW).
Executive Directors	Business as usual.	Need to be prepared to receive requests for information around increased admissions due to the heat from Public Health Wales and/or Welsh Government and / or media.	Watching brief from COO and Head EPRR, to include exception reports from Tactical (Silver) control. Be prepared to attend Strategic (Gold) incident command centre.	Attend UHB Strategic (Gold) incident command centre. At this stage a MAJOR INCIDENT will be declared and the UHB will convene a strategic (Gold) command meeting to ensure that all areas of the Health Board are coping with responding to the event. It is highly likely that a multi-agency Strategic Command Group will be activated by the South Wales Police. Be prepared to be nominated to attend the multi-agency SCG.

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
Chief Operating Officer (COO)	Monitor routine business continuity planning within clinical boards. Support long term service planning to mitigate the effects of adverse weather on the UHB and its resources.	Ensure all Clinical Boards are maintaining heightened vigilance and reviewing pre planned interventions.	Formally declare business continuity incident. Provide Strategic level oversight and leadership. Receive exception situation reports from Tactical (Silver) control. Provide Watching brief for CEO / Executive Directors. Ensure that hospital services are in a state of readiness to cope with the anticipated rise in admissions. Discharge planning should reflect local and individual circumstances so that people at risk are not discharged to unsuitable accommodation or reduced care during extreme heat	Attend UHB Strategic (Gold) incident command centre. Adopt role of Strategic lead of the Recovery Group focusing upon consequence management.

	Meteorological Office Alert level			
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
			conditions. Consideration will need to be given to the effectiveness of different bed-utilisation arrangements.	
Head EPRR	Support routine business continuity planning throughout the UHB. Highlight the importance of regular review, monitoring and evaluation of the business continuity plans so as to ensure that heatwave preparedness and response arrangements are up to date.	Commence weather alert cascade. Disseminate Welsh Government advice and information to all appropriate persons.	Provide professional advice to the UHB Tactical (Silver) Incident Control Centre. Act as link with SWLRF and facilitate multi agency communication if required.	Attend UHB Strategic (Gold) incident command centre. Be prepared to attend the multi-agency SCG.
Strategic Communication and Engagement	Business as usual, including links with the SWLRF Warning and Informing sub group to meet statutory CCA obligation.	Make relevant advice, guidance and information available for members of the public, health, social and other care professionals prior to, and during, extreme heat conditions.	Attend UHB Tactical (Silver) Incident Control Centre. Formally cascade information that a business continuity incident has been declared.	Attend UHB Strategic (Gold) incident command centre. Formally cascade confirmation that Major Incident has been declared.

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
	Foster the development of strong working links with the media so that advice and information can be communicated promptly both before, and during, a heatwave.	Such advice, guidance and information should be readily available and easily accessible to those who need it.	Need to be prepared to receive requests for information around fatalities. Actively promote stay safe, stay cool advice contained within appendix 6.	Activate links with WG and SWLRF communication cells.
Clinical Board triumvirates	Business as usual. Promote routine business continuity planning	Review surge capacity and the need for, and availability of, suitably trained staff support in the event of extreme heat conditions or heat-wave, especially if over a prolonged period.	Attend UHB Tactical (Silver) Incident Control Centre. Formally cascade information that a business continuity incident has been declared to all service leads. Ensure a staff rota for the next 24-48 hours (working a maximum 6-hour shift). Commission additional care and support, involving at least daily contact, as necessary for at-risk	Attend UHB Tactical (Silver) Incident Control Centre. Formally cascade confirmation that Major Incident has been declared. Ensure a staff rota for the next 24-48 hours (working a maximum 6-hour shift).

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
			individuals living at home. This may involve informal carers, volunteers and care workers. Action should be targeted at people with mobility or mental health problems or receiving medication likely to give rise to heat-related risks, and those living in accommodation that cannot easily be kept cool.	
Lead Nurse / Head of Department / Service team leaders	Business as usual.	As death rates rise soon after temperature increases, with many deaths occurring in the first two days of a heat wave, this is an important stage at which to ensure readiness and swift action to reduce harm from a potential heat wave.	Establish communication with your service area “Bronze” coordination team, and ensure staff are aware of the route to escalate concerns. On receipt of an amber alert the information must be cascaded to all staff	At this level, illness and death may occur among the fit and healthy, not just in those at-risk individuals, and will require a multi-sector response at national and regional levels. Formally cascade confirmation that Major Incident has been declared

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		All staff should ensure that high risk patients are identified and monitored. Where appropriate they or their carers should be given suitable advice to reduce the risk of adverse effects on their health (See Appendix 6). Indoor thermometers should be installed in each room in which vulnerable individuals spend substantial time (bedrooms and living and eating areas) and, during a heatwave, indoor temperatures should be monitored at least four times a day. If temperatures exceed 26ºC, high-risk individuals should be moved to a cool area that is 26ºC or below.	to ensure that high risk patients are monitored in accordance with pre-determined care plans. Appropriate measures must be taken to minimise the effects of the heat on patients and staff. Ensure that staff know which rooms are the easiest to keep cool and which are the most difficult, and review the distribution of patients according to those most at risk. Create cool rooms or cool areas. High-risk groups that are vulnerable to the effects of heat are physiologically unable to cool themselves efficiently once temperatures rise above	

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		Give consideration to flexible visiting hours. Thereby preventing high numbers of people on wards in a short time span; and reducing need for family/friends to travel during the hottest part of the day.	26ºC. Therefore, every ward should be able to provide a room or area that maintains a temperature at 26ºC or below. Consider amendment to staff uniform to minimise discomfort. If safe to do so allow staff to wear light, loose-fitting cotton clothes. Factor in additional rest periods for staff and ensure that they avoid extreme physical exertion. This may necessitate additional staff on rotas. Ensure free access to a cold water supply.	
Ward / Dept Manager	Business as usual.	Make sure you know which patients are most at risk.	Establish communication with your service area “Bronze” control, and ensure	Ensure all staff are aware that a Major Incident has been declared.

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		Establish if you have any staff members who should be considered at risk, and who require modified working practices. Ensure you have protocols / safety briefings to monitor high risk patients and to provide additional support (body temperature, pulse rate, blood pressure and dehydration will need to be monitored regularly). Engage medical staff / pharmacist to ensure a medication review is undertaken for high risk patients. Discourage patients from physical activity and going out during the hottest	staff are aware of the route to escalate concerns. Monitor patients frequently. Check body temperature, heart and breathing rates, blood pressure and hydration levels. Observe patients for any changes in behaviour, especially excessive drowsiness. Watch for signs of headache, unusual tiredness, weakness, giddiness, disorientation or sleeping problems. Monitor all patient's fluid intake, providing regular cold drinks, particularly if they are not always able to drink unaided. Oral rehydration salts are	

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		part of the day (11.00am to 3.00pm). Check that patients have light, loose-fitting cotton clothing to wear. Encourage patients to remain in the coolest parts of the building as much as possible. Move patients so that each spends time in the cool room/area (26ºC or below) – give priority and extra time to high-risk patients or any showing signs of distress (including increased body temperature). Minimise heat generation by turning off non-essential lights and electrical equipment.	suggested for those on high doses of diuretics. Bananas, orange juice and occasional salty snacks can also help replace salts lost due to sweating (consult dieticians). Advise patients to avoid caffeine (coffee, tea, colas), very sweet drinks and alcohol. Regularly sprinkle or spray cool water on exposed parts of the body. A damp cloth on the back of the neck helps with temperature regulation. Arrange cool showers or baths if possible. Keep curtains and windows closed while the	

Meteorological Office Alert level				
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		If patients / families / carers are seeking advice Appendix 6 - A guide to looking after yourself and others – can be printed and distributed accordingly.	temperature outside is higher than it is inside. Once the temperature outside has dropped lower than the temperature inside, open the windows. This may not be until very late at night or the early hours of the morning.	
Primary care services and General Practitioners	Business as usual. Routine monitoring of vulnerable groups. Where individual households are identified as being at particular risk from hot weather, a request can be made to local authority Environmental Health professionals to undertake an assessment using the Health Housing and Safety Rating System.	Make sure you know which patients are most at risk. Identifying and implementing necessary changes to individual care plans for those in high-risk groups, including initiating daily visits by formal or informal carers to check on people living on their own Ensure you have protocols / safety briefings to monitor high risk patients and to provide additional support	Establish communication with your service area “Bronze” control, and ensure staff are aware of the route to escalate concerns. On receipt of an amber alert the information must be cascaded to all staff to ensure that high risk patients are monitored in accordance with pre-determined care plans.	Ensure all staff are aware that a Major Incident has been declared.

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		(body temperature, pulse rate, blood pressure and dehydration will need to be monitored regularly). Work with families and informal carers of at-risk individuals to raise awareness in respect of the dangers of heat, how to keep cool and put in place simple protective measures e.g. installing appropriate ventilation and ensuring fans and refrigerators are available and in good working order. Engage GPs / pharmacist to ensure a medication review is undertaken for high risk patients.	Appropriate measures must be taken to minimise the effects of the heat on patients and staff. At-risk groups include: older people, especially women over 75 years old, or those living on their own and who are socially isolated, or in a care home; those with chronic and severe illness, including heart conditions, diabetes, respiratory or renal insufficiency, Parkinson's disease, or severe mental illness. Medications that potentially affect renal function, sweating, thermoregulation or electrolyte balance can make this group more vulnerable to the effects of	

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		Discourage patients from physical activity and going out during the hottest part of the day (11.00am to 3.00pm).	heat; and those who are unable to adapt their behaviour to keep cool, including those with Alzheimer's or a disability, or who are bed bound. Ensure details of the PCIC Bronze coordination team are known by all staff (including GPs) to ensure early identification and communication of any safety concerns.	
Capital Planning, Estates and facilities	Business as usual. Promote routine business continuity planning for all critical support services. Promote and facilitate long-term multi-agency planning to adapt to, and reduce the impact of, climate change, including 'greening the built	The Maintenance Department, Estates, will need to be prepared for an increased demand from the organisation for equipment checks. In addition, in conjunction with the Fire Safety Team they will jointly identify any 'at risk' plant that may pose	Check that there is a supply of fans, and that \ air conditioning working in clinical areas. (But note that energy use tends to go up during a heatwave due to increased use of fans and air-conditioning. These measures generate heat and make air quality worse. Therefore long-term	Ensure all staff are aware that a Major Incident has been declared.

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
	environment', insulating and increasing shading around buildings, improving energy efficiency and reducing carbon emissions. Pro-actively determine the resilience of their estates and equipment, especially medical and IT systems, to ensure that, where necessary, they can be maintained at working temperatures and there is no risk of system failure through overheating.	a hazard during hot weather. Where possible, cool rooms or areas should be made available. High-risk groups who are vulnerable to the effects of heat are physiologically unable to cool themselves efficiently once temperatures rise above 26ºC10. Therefore, it is desirable for each care facility to provide a room or area that maintains a temperature of 26ºC or cooler. As a guide, and where possible, hospitals should aim to maintain temperatures throughout the hospital at or below 26ºC during extreme heat conditions.	planning should aim to maximise energy neutral cooling mechanisms). Arrange for cool drinks to be distributed regularly to patients by catering services**.** Ensure cool drinking water is freely available to staff. Adapt menus to cold meals (preferably with a high water content such as fruit and salads). Increase outside shading. Spraying water on the ground outside helps to cool the air (avoid creating slip hazards)	

Meteorological Office Alert level				
	Level 1 (GREEN)	**Level 2 (YELLOW)**	**Level 3 (AMBER)**	**Level 4 (RED)**
		Ensure the dissemination of routine building security advice, whilst acknowledging the increase in temperature may result in a greater number of doors and windows being left open.	Monitor temperatures inside the building at least four times a day. Make the most of cooler night time temperatures to cool the building with ventilation. High night time temperatures have been found to be especially associated with excess mortality.	

Appendix 5 References

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