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Static air support surfaces to prevent pressure injuries

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PREVENTING PRESSURE INJURIES WITH REPOSE® - A MULTICENTRE COHORT STUDY IN BELGIAN NURSING HOMES

THE ORTHOPAEDIC JOURNEY

CONTENTS

PROFESSOR KEITH HARDING, CBE FRCGP FRCP FRCS FLSW

Dean of Clinical Innovation at Cardiff University and Medical Director of the Welsh Wound Innovation Initiative, Professor Keith Harding has had a longstanding interest in wound healing. He was appointed as the first Director of the Wound Healing Research Unit in 1991; from 2011–2013 he was Director of the TIME Institute and Head of Wound Healing Research Unit, School of Medicine, Cardiff University and Clinical Lead for Wound Healing in the Cardiff & Vale NHS Trust. His clinical practice is exclusively focused on treating patients with wound healing problems with a wide range of aetiologies. In 2013 he was awarded £4.2 million to set up the Welsh Wound Innovation Initiative. He was awarded the CBE in the New Year Honours list in January 2013.

PROFESSOR DR. DIMITRI BEECKMAN, RN BSC MSC PHD

Professor Dimitri Beeckman is a registered nurse with a background in critical care nursing. He is professor at the Department of Public Health, Ghent University, Belgium. Besides, he is a visiting professor at the University of Surrey (UK). He is the previous chair of the Scientific Committee of the European Pressure Ulcer Advisory Panel and author of the Belgian pressure ulcer prevention guidelines. He is particularly interested in pressure ulcer prevention and incontinence-associated dermatitis.

TRACEY EMMS, RGN

Her career in healthcare started in August 1982 within the capacity of YTS; she flourished during that time and then joined the NHS as a Healthcare Support worker in Trauma & Orthopaedics until the following year, when she commenced her nursing training as a Pupil Nurse.

Upon completion of her training, Tracey went back as an Enrolled Nurse to her passion of Trauma & Orthopaedics; during this time she undertook her conversion course and in 2001 moved into a synergistic role to her speciality when she became the Specialist Nurse for Osteoporosis. In 2007, she returned back to Trauma & Orthopaedics as a Clinical Sister and finally achieving her current role as Ward Manager in 2009.

Along with her passion for Trauma & Orthopaedics, Tracey has been proactive with pressure ulcer issues working tirelessly with some of the more challenging issues and became a champion for the Trust with pressure ulcer initiatives.

LORRAINE THURSBY, RGN

Lorraine Thursby has worked within the NHS since 1984 starting life as a nursing auxiliary before settling to a career in nursing. She has also worked outside the NHS within the commercial sector as a clinical/nurse advisor and product specialist for medical equipment providers for pressure relieving beds and mattresses. In the latter years her nursing career developed and she became a Clinical Nurse Specialist in Tissue Viability, successfully initiating a trust wide service. She eventually left the NHS to enter back to the commercial sector as a UK Clinical Education Manager for a Wound Management Company. Lorraine returned to the NHS in August 2005 to take up the challenge of recommencing the Manual Handling Service at George Eliot Hospital NHS Trust and has also completed the Post Graduate Certificate in Back Care Management at Loughborough University. Her role is rather unique as it has developed further combining both subject knowledge and skills and is Service Lead for Manual Handling and Tissue Viability within her Trust, a role that is believed to be first of its kind in the UK.

Working in an acute Trust she is used to the challenges of complex and chronic wounds and the multifaceted approach required to achieve healing.

CHAIR - PROFESSOR KEITH HARDING

MEDICAL DIRECTOR, WELSH WOUND INNOVATION CENTRE (WWIC)

Chair's Introduction

The Welsh Wound Innovation Centre (WWIC) is the first national wound healing centre of excellence within the UK. It was built upon the success of a wound healing group in Cardiff that initially started in 1972 and developed into the Wound Healing Research Unit (WHRU) in 1991. Formally launched in September 2014 as a centre of excellence in skin health, wound prevention and treatment, it uniquely brings together the key voices on wounds in Wales spanning government, NHS, academia, industry and the Third Sector. WWIC is based on a model that triangulates around the academic, medical and commercial axis in Wales, integrating academic activity with clinical service delivery whilst supporting Welsh based industry of which Frontier Medical is a key element.

Frontier Medical have a strong relationship with WWIC which has existed for twenty years, initially with the Wound Healing Research Unit. These two organisations worked collaboratively to develop the Repose concept into a commercially successful range of support surfaces that can improve clinical outcomes for patients who are at risk of developing, or, already have pressure ulcers. Consequently, in 1999, the WHRU undertook one of the first comparative clinical trials on the Repose Mattress Overlay to establish a research base for the product.

As with all concepts they are refined and developed and the speakers in this symposium will provide contemporary examples of how both the Repose research and clinical agendas have developed.

Aim of this publication

The aim of this booklet is to share the details of a national symposium that discussed the role of static air support surfaces, namely Repose Mattress Overlay, Cushion, Wedge and Foot Protectors, in pressure ulcer prevention. The first piece of research investigates the potential role of the Repose range in preventing pressure ulceration in 176 mobility restricted residents in nursing homes in Belgium. The second section discusses the reactions and interventions of an orthopaedic multidisciplinary team in an English hospital, who were responding to a national newspaper report that patients were most at risk of developing pressure damage following admission to their hospital.

This publication and its contents would merit inclusion as part of the Nursing and Midwifery Council (NMC) revalidation process for nurses to retain their registration. The time taken to read the publication can be recorded as part of the 35 hours of continuous professional development. Further reflection on the content and linking it to clinical practice and the NMC code can then form one of the five written reflective accounts. The appendices at the end of this document provide NMC templates for the reflective account and subsequent reflective discussion.

The Repose range of products

“Repose comprises a range of pressure ulcer prevention devices which are clinically proven to support the prevention and management of pressure damage, providing comfort and effective pressure redistribution for all people at risk of developing pressure ulcers, including those assessed as very high risk. (Image 1). Repose is easy to clean and re-usable, making them a cost-effective method of providing pressure redistribution.

Repose products are supplied deflated and are packed inside a compact and lightweight pump for easy storage in-between use and transportation. The Repose pump inflates products to the optimum pressure, providing reassurance that Repose cannot be over inflated.

There is a selection of solutions that Repose has to offer, including Foot Care, Surface, Seating and Paediatric Solutions.

Repose Foot Care Solutions are designed to provide heel off-loading and pressure redistribution of the lower limb such as, Repose Foot Protector Range, Repose Wedge and Repose Sole Protector, can either be used alone or in combination with other dynamic or static support surfaces.

Repose Surface and Seating Solutions has proved uniquely comfortable as well as providing effective pressure redistribution and are supplied with fixing straps to firmly keep the product in place providing reassurance and stability. Within Repose Surface Solutions is Repose Companion and Trolley Companion, designed to assist with lateral transfers between support surfaces. Rather than transferring between surfaces, the individual remains on Repose Companion and are transferred from one surface to another for continuous pressure redistribution.

Repose Paediatrics solutions are designed to meet multiple patient needs. Repose paediatrics products such as the Babynest and Babytherm and Paediatric Mattress Overlay aim to reduce pressure ulcer formation during the first stages of a pre term infant’s life

Education regarding how to use each product in the Repose range is demonstrated very effectively on the Frontier Medical website: http://www.frontier-group.co.uk/”

Image 1—Repose range of products

PROFESSOR DR. DIMITRI BEECKMAN, RN, BSC, MSC, PGDIP(ED), PHD

Department of Public Health, University Centre for Nursing and Midwifery, Ghent University

STATIC AIR SUPPORT SURFACES TO PREVENT PRESSURE ULCERS

Pressure ulcers are internationally recognised as adverse outcomes and a key clinical indicator of the quality of care. A pressure ulcer is defined as localised damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful.

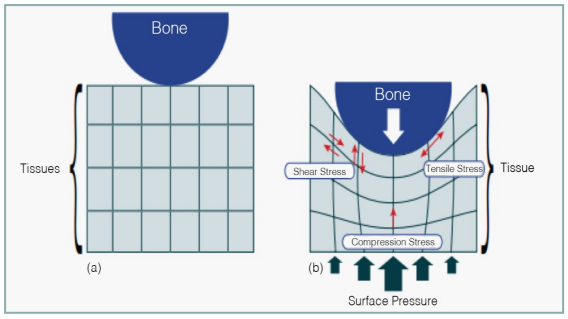

Figure 1—Impact of pressure on tissue

The injury occurs because of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue (National Pressure Ulcer Advisory Panel, 2014). The mechanisms that lead to tissue destruction include muscle deformation and subsequent reduction in oxygen supply to the tissues which results in ischaemia, hypoxia, glucose depletion and tissue acidification. Pressure damage occurs due to a short period of high pressure and shear as well as the continuous application of low pressure/shear forces on the skin.

Pressure ulcer prevention and treatment interventions are one of the most frequently applied aspects of care delivered by nurses. Consequently, the economic impact of these interventions for healthcare organisations is very significant. A Belgium cost-of-illness study published in 2015 demonstrated that the mean cost for pressure ulcer prevention was €7.88 per hospitalised patient at risk per day and €2.15 for the nursing home residents at risk per day. Local treatment for pressure damage had increased costs attached to it of €77.36 per patient per day for hospital treatment and up to €16.18 in the nursing home setting. The major cost driver was nursing time; the annual cost for pressure ulcer treatment was €165.75.

Pressure redistributing support surfaces can assist in pressure ulcer prevention and can take the form of low-tech, constant low pressure support surfaces which use the principles of immersion and envelopment to redistribute pressure. Alternatively, high-tech support surfaces have a dynamic activity based on various cycles of inflation and deflation of air cells.

It has already been established that static air support surfaces are an effective part of pressure ulcer prevention. However, a new study was designed to investigate the incidence and risk factors for developing pressure ulcers in patients placed on the Frontier Repose range of products

Image 2—Repose range of products

which included the Mattress Overlay, Wedge and Cushion (Image 2). This gives a realistic picture of a patient's day during which a variety of pressure redistributing support surfaces are used. This study is as a precursor to a larger randomised controlled trial and was necessary to establish key aspects of the research design such as number of patients required to establish if there is a difference in therapeutic efficacy of the Repose range compared to alternative support surfaces.

The study was a cohort study that reports the incidence of pressure ulcers among Belgian nursing home patients.

Nursing home residents were recruited across a convenience sample of six Belgian nursing homes. The study inclusion criteria were:

- Bedbound (>8 hours in bed)
- Chairbound (>8 hours seated)
- Braden score <18 and/or Category I pressure ulcer
- Older than 65 years
- Weight < 139 kgs

And the exclusion criteria were:

- Expected length of stay under two weeks
- Receiving palliative care
- With 'do not resuscitate' instruction
- Medical contraindication to a static mattress overlay
- Pressure ulcer category II and above

The study end-points were:

- Development of a pressure ulcer category II or higher
- No pressure ulcers after 30 days
- Transfer to a non-participating location
- Death or voluntary withdrawal

All nurses in the participating nursing homes received education upon pressure ulcer prevention and the study protocol plus objectives, two weeks prior to the start of recruitment.

Upon consent being given by the residents, the care regime was:

- Rested on static mattress overlay and heel protector for 30 days
- Four hour repositioning in bed
- Two to three hour repositioning in chair (with Repose Cushion and Repose Foot Protector)
- Daily skin assessments by the nursing home staff performed by both qualified and unqualified staff (under supervision)

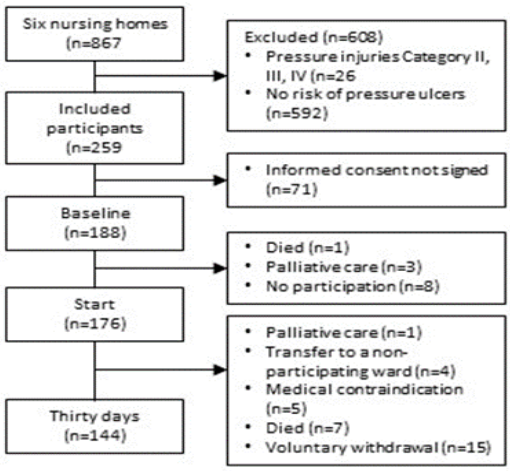

Table 7—Summary of study recruitment

- Weekly unannounced visits by investigator to check accuracy of data gathered by nursing home staff

867 residents were screened with 259 meeting the study inclusion criteria. Informed consent was gained from 188 residents. Of these, 12 did not start the study (died n=1; palliative care n=3, no participation n=8) leaving 176 residents who were allocated Repose products. After 30 days 144 residents were still in the study (palliative care n=1; transfer to non-participating site n=4; medical contraindication n=5, died n=7, voluntary withdrawal n=15). (Table 7)

The 176 residents who started the study were elderly with a mean age 87 years; 77% were female. Of the participants, 90% were incontinent of urine and 69% incontinent of faeces. The majority (67%) received tranquillizers or sleep medication. The mean Braden score for the participants was 14. Before the study the participants had been nursed on viscoelastic mattresses (n=80), dynamic air mattresses (n=45), static air mattresses (n=4) with 59 (31%) having no pressure redistributing support surface. The mattress upon which the Repose overlay was placed during the study was not specified.

During the study, 9 developed pressure ulcers – 6 category II and 3 category III pressure ulcers with most (n=8), at the sacrum. The median time to develop a pressure ulcer was 16 days. The low incidence of pressure ulcers prevented the identification of risk factors for pressure ulcer development. However, if category I pressure ulcers were included in the analysis, then long periods of sitting in a chair (over 6 hours) was a significant risk factor for pressure ulcer development.

The skin assessments performed by the nursing home staff and the independent researcher were almost identical.

Conclusion

Among a cohort of elderly nursing home residents who were vulnerable to pressure ulcer development, 9/176 (5.1%) developed pressure ulcers over the 30-day study period with most of these wounds being superficial (only three full thickness pressure ulcers developed).

This cohort study has provided essential information for the design of the next multi-centre prospective randomised controlled study titled "The prevention of category I-IV pressure ulcers using static support devices". This study is currently underway and aims to recruit 306 high risk patients with completion expected within 18 months.

Take away message

These results have demonstrated the role of static support surfaces as a key component in pressure ulcer prevention and future research is being undertaken to establish a broader evidence base for the Repose range of products.

Brecht Serraes, Dimitri Beeckman, Static Air Support Surfaces to Prevent Pressure Injuries: A Multicenter Cohort Study in Belgian Nursing Home. *Journal of Wound Ostomy & Continence Nursing,* 2016; Vol 43(4): p.E1

TRACEY EMMS RGN, Ward Manager, Nason Ward
& LORRAINE THURSBY RGN Service Lead, Manual Handling & Tissue Viability
George Eliot Hospital NHS Trust

REPOSE COMPANION – THE ORTHOPAEDIC JOURNEY

Introduction

The George Eliot Hospital is a 352-bedded district general hospital in England within which Nason is a 27-bedded mixed sex orthopaedic ward. (Image 3)

Image 3—George Eliot Hospital

For older people, hip fracture is the most common serious injury; and the most common reason for this patient population to require emergency anaesthesia and surgery; it is also the most common cause of accidental death. Following a fractured hip most patients will remain in hospital for several weeks which equates to the continuous occupation of over 4,000 NHS beds and a total cost to health and social services of over £1bn per year (National Hip Fracture Database Annual Report, 2016).

In 2012, the George Eliot Hospital was named in a national newspaper as a place where the public are most at risk of contracting pressure damage. This became the catalyst for change; a root cause analysis was undertaken that involved examining the patient journey for fractured neck of femur (NOF) patients. The respective patients were identified as being at risk of pressure damage for a multitude of reasons that included their advanced age and frailty and associated co-morbidities e.g. Diabetes Mellitus. Specific elements relating to the fractured femur injury included time spent on a hard surface following injury and a low haemoglobin level following bleeding at the time of the trauma. As well as patient-related factors, organisational factors were increasing the risk of individuals acquiring pressure damage which included patients not being admitted to the orthopaedic ward and a lack of pressure redistribution in the pre-operative phase.

External examples of good care were highlighted by the Midlands and East of England Stop the Pressure collaborative, specifically the 'React to Red campaign' (http://www.reacttoredskin.co.uk/). This provided the Nason Ward Manager with direction, motivation and purpose to improve the situation at the George Eliot Hospital. A fractured NOF care pathway was already in existence although it did not provide any specific advice on pressure redistribution. The Manual Handling & Tissue Viability Service Lead worked alongside the Ward Manager and together they decided to introduce Repose Companion product into the fractured femur pathway. (Image 4)

Repose Companion is a unique device which moves with the patient, combining effective pressure redistribution and safer lateral transfers.

Image 4—Repose Companion

Methodology

Repose Companion is a unique device which combines effective pressure redistribution with a slide sheet base material to assist with lateral transfers. It is also radiolucent and can be cleaned per the infection control standards for a hospital mattress. As the equipment stays under the patient, this assists with patient handling which is known to be physically demanding, is often performed under unfavourable conditions and can be unpredictable in nature. The cumulative weight lifted by a nurse in one typical eight-hour shift is equivalent to 1.8 tons within the 'normal' patient population (Nelson et al, 2006).

A patient is likely to experience a wide variety of support surfaces throughout their journey from admission to discharge and whilst some may provide adequate pressure redistribution, typically, most will not. In addition, transfers between surfaces may themselves cause pressure damage due to shear forces exerted in many lateral transfer procedures. In the case of the George Eliot Hospital, this journey starts in the Accident and Emergency department following a telephone call from the paramedics to alert a patient with a fractured NOF will need to be admitted. Repose Companion remains with the patient as they move to the x-ray department, intensive care setting and the ward until discharge. Following patient discharge the equipment is cleaned and returned to the Accident and Emergency department for the next patient admitted with a fractured NOF. Repose (Figure 2) This meets the challenge set

by the Occupational Safety and Health Administration (2002) for organisations to ensure that provisions are made to deliver safe systems of work, hence adequate equipment to facilitate patient care. This involves safe transfer practice for both the patient and the healthcare personnel, with ultimately a reduction in manual handling injuries.

As with any change in practice, audit must occur to establish the impact of the change and for Nason Ward, this was a dramatic reduction in the number of patients developing pressure damage.

Results

These three tables demonstrate the reduction in pressure ulcers. In 2014/15 there were 31 category 2 and 23 category 3 pressure ulcers (Table 1). However, this had reduced by 42% (category 2) and an even larger reduction of category 3 (66%) (Table 2). The change has demonstrated sustainability by becoming embedded in practice and the number of pressure ulcers continued to reduce in 2016/7 (Table 3).

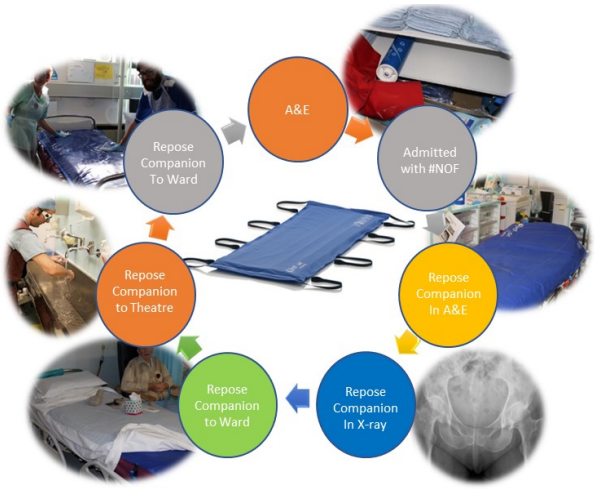

Figure 1—George Eliot Hospital pressure injury journey

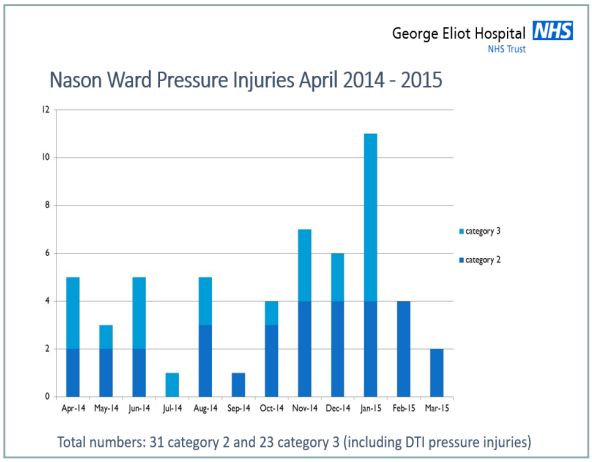

Table 1—Nason Ward Pressure Injuries 2014-2015

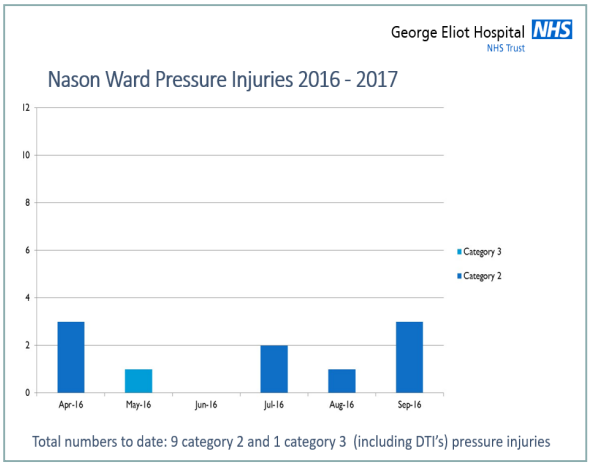

Table 3—Nason Ward Pressure Injuries 2016-2017

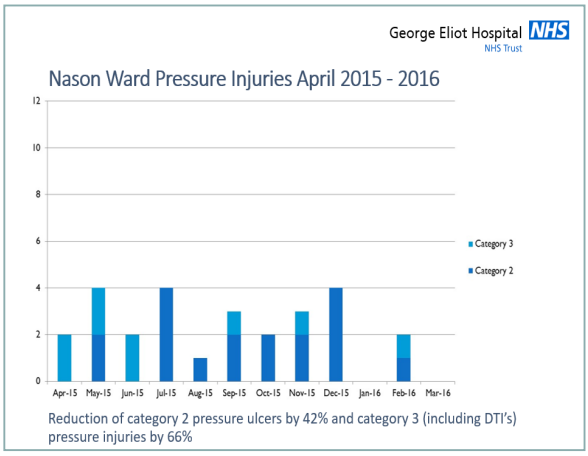

Table 2—Reduction in Nason Ward Pressure Injuries

Discussion

This example of a change in care delivery for patients with a fractured hip has become embedded in practice and has made a significant difference in reduction of harm for patients and staff. The change is not complex and had buy in from all individuals involved in the care delivery for the patients e.g. nurses, radiographers, paramedics. The team approach was a key component in making the change an entrenched part of the care for patients with a fractured hip. The outcome of the change initiated by the multi-disciplinary team has had a significant impact in the reduction in pressure damage to the patient group

Summary of the Booklet

The reduction in pressure damage for hospital, community and care home patients is high on the national and international health care agendas. A pre-requisite to achieving a reduction in pressure damage is the introduction of drivers and initiatives that will promote a positive attitude and willingness to improve pressure ulcer prevention.

The presentations summarised in this document demonstrate how static support surfaces can reduce pressure damage both from a research and clinical practice perspective. Developing the research evidence in the field of static support surfaces can only enhance the current body of knowledge. However, without the integration of the evidence-base into clinical practice the opportunity to improve patient care can be lost. The presentations are excellent examples of high quality clinical research in a very vulnerable patient population and a team approach to innovation that addresses a real issue for patients - the development of pressure damage. Both these examples should motivate individuals wanting to undertake research into pressure damage and clinicians that want to enhance the care they deliver to patients. It is the combination of real world research and clinical change that has enabled patients to receive high quality care and importantly a reduction in pressure damage.

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APPENDIX I

REVALIDATION

The above learning event can be used towards nursing revalidation. Revalidation is the process that allows an individual to maintain their registration with the Nursing and Midwifery Council (NMC). It allows the individual to demonstrate their continued ability to practice safely and effectively. It is a continuous process that nurses will engage with throughout their careers. One of the main strengths of revalidation is that it reinforces the Nursing and Midwifery Council code and professional standards expected of nurses.

There are several aspects of the revalidation process

- 450 practice hours or 900 hours if revalidating as both a nurse and a midwife
- 35 hours of continuing professional development (of which 20 must be participatory)
- Five pieces of practice-related feedback
- Five written reflective accounts
- Reflective discussion
- Health and character declaration
- Professional indemnity arrangement
- Confirmation

The information provided in this document could be used for a written reflective account or as part of a reflective discussion with a fellow NMC registered nurse or midwife. Below are the reflective accounts form and the reflective discussion form that must be used to record the activities. Further information can be found at http://revalidation.nmc.org.uk/

Contact Details:
Frontier Medical Group, Newbridge Road Industrial Estate, Newbridge Rd, Pontllanfraith, Blackwood NP12 2YN
Tel: 01495 235 800, Email: info@frontier-group.co.uk

REFLECTIVE ACCOUNTS FORM

You must use this form to record five written reflective accounts on your CPD and/or practice-related feedback and/or an event or experience in your practice and how this relates to the Code. Please fill in a page for each of your reflective accounts, making sure you do not include any information that might identify a specific patient, service user or colleague. Please refer to our guidance on preserving anonymity in Guidance sheet 1 in *How to revalidate with the NMC*.

Reflective account:
What was the nature of the CPD activity and/or practice-related feedback and/or event or experience in your practice?
What did you learn from the CPD activity and/or feedback and/or event or experience in your practice?
How did you change or improve your practice as a result?
How is this relevant to the Code? Select one or more themes: Prioritise people – Practise effectively – Preserve safety – Promote professionalism and trust

REFLECTIVE DISCUSSION FORM

You must use this form to record your reflective discussion with another NMC-registered nurse or midwife about your five written reflective accounts. During your discussion you should not discuss patients, service users or colleagues in a way that could identify them unless they expressly agree, and in the discussion summary section below make sure you do not include any information that might identify a specific patient or service user. Please refer to Guidance sheet 1 in How to revalidate with the NMC for further information.

To be completed by the nurse or midwife:

Name:	
NMC Pin:	

To be completed by the nurse or midwife with whom you had the discussion:

Name:	
NMC Pin:	
Email address:	
Professional address including postcode:	
Contact number:	
Date of discussion:	
Short summary of discussion:	
I have discussed five written reflective accounts with the named nurse or midwife as part of a reflective discussion.	**Signature:**
I agree to be contacted by the NMC to provide further information if necessary for verification purposes.	**Date:**

For more information:

Call +44 (0)1495 235800
Email: info@frontier-group.co.uk
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