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‘Failure to Maintain’: A theoretical proposition for a new quality indicator of nurse care rationing for complex older people in hospital.

International Journal of Nursing Studies

Background: Complex older patients represent about half of all acute public hospital admissions in Australia. People with dementia are a classic example of complex older patients, and have been identified to have higher rates of hospital-acquired complications. Complications contribute to poorer patient outcomes, increase length of stay and cost to hospitals. The care for older people with dementia is complex, and this has been attributed to: their cognitive response to being hospitalised; their limited ability to self-care; and lack of nursing engagement with the family caregiver. Registered nurses can offer simultaneous assessment and intervention to prevent or mitigate hospital-acquired complications. However, it is known that when demand for nursing care exceeds supply, care is prioritised according to acute medical need. Consequently some basic but essential nursing care activities such as patient mobility, communication, skin care, hydration and nutrition are implicitly rationed.

Objective: This paper offers a theoretical proposition of ‘Failure to Maintain’ as a **conceptual framework** to indicate implicit care rationing by nurses. Care rationing contributes to functional and cognitive decline of complex older patients, which then contributes to higher rates of hospital acquired complications. Four key hospital acquired complications: pressure injuries, pneumonia, urinary tract infections and delirium are proposed as **measurable indicators** of ‘Failure to Maintain’.

Discussion: Hospital focus on throughput constrains nurses to privilege predictable, solvable and medically-related procedures and processes that will lead to efficient discharge over patient mobility, communication, skin care, hydration and nutrition. This privileging, also known as implicit rationing, is theoretically and physiologically associated with a rise in the incidence of complications such as pressure injuries, pneumonia, urinary tract infection, and delirium. Complex older patients, including those with dementia, are at higher risk of the complications, therefore should have higher delivery of prophylactic intervention (ie have higher care needs). ‘Failure to Maintain’ offers a conceptual framework that is inclusive of, and sensitive to, this vulnerable population.

Conclusion: Implicit rationing is occurring and it likely contributes to functional and cognitive decline in complex older patients and hospital-acquired complication. However, the lack of patient functional ability data at admission and discharge for hospitalised patients, and lack of usable ward and hospital level nurse staffing and workload data makes it difficult to monitor, understand and improve quality of care. Current research in the fields of acute geriatrics and nursing work environments show promise through enabling multidisciplinary team communication, and facilitating clinical autonomy to provide patient focussed care, and avoid ‘Failing to Maintain’.

Recommendations: The research field of acute geriatrics can understand and act on the risk modification role of nurses, including controlling for nurse staffing and work environment variables in intervention studies. The research field of nurse sensitive outcomes should incorporate the different profile of complex older patients, by including age brackets and functional ability as

variables in their studies. Clinically, nursing work environments can be designed to recognise the different profile of complex older patients by adapting practices to privilege mobility, hydration, nutrition, skin care and communication in the midst of acute care interventions.

1. Background

1.1 Complex older patients have more hospital complications

Despite excellent health care in a range of first world countries, unintended injury that occurs during hospital admissions remains a concern. Complications in hospital are unfortunate for patients, and also expensive for hospitals and states. Four key complications – urinary tract infections, pressure injuries, pneumonia and delirium - known to be sensitive to nursing care were associated with A\$226 million for extra days in hospital in one state in Australia in one year (Bail et al., 2015). These four complications were higher in patients diagnosed with dementia compared to those without dementia. Patients with dementia are a classic example of complex older patients. Other examples of complex older patients include multiple comorbidities and high acuity during hospitalisation (Schaink et al., 2012). There is increasing understanding that small events in hospital can trigger larger complications; such as untreated pain resulting in decreased patient movement, leading to lower lung volumes, atelectasis and respiratory depression – this is termed ‘cascade iatrogenesis’ (Thornlow et al., 2014).

‘Care bundles’ have been found to reduce these kinds of complications by disrupting the cascade (eg (Gray-Siracusa and Schrier, 2011, Malouf-Todaro et al., 2013, Quinn et al., 2014, Schneider, 2012, Soban et al., 2011). Care bundles seek to embed a range of care practices, through education, training, and structural support in the form of suitable policies, procedures and resources, and leadership. Care bundles emerged through the recognition that there is no single intervention for complex cases (Marwick and Davey, 2009). Examples from bundles of care to prevent urinary tract infections include policy encouraging nurses repeatedly asking ‘why does this patient still have a catheter?’ (Salamon, 2009), or a written reminder by nurses for physicians to remember which patients have a catheter (Saint et al., 2005), or where the catheter removal protocol is nurse-directed (Parry et al., 2013).

Nurses are considered the front line in implementing these care bundles in the hospital setting (Gray-Siracusa and Schrier, 2011), and are well positioned to identify complications early and intervene due to their bedside contact, patient rapport and team liaison (Aranda and Brown, 2006). Preventative and risk mitigating care actions of nurses are established to prevent the four key complications of urinary tract infection, delirium, pressure injuries, and pneumonia. Prevention care actions include a range of individually simple tasks (see Table 1), but often require expertise to deliver in the complex and changing hospital environment.

Insert Table 1. Effective preventative nursing interventions for the four key complications

1.2 Nurses ration care

Nurses prioritise which care activities to complete first in a complex and changeable hospital environment, with increasingly specialised treatment regimens for an ageing population which has higher levels of comorbidities (Nobili et al., 2011). In setting priorities, nurses may deem some care as necessary for the patient, but unable to be completed due to time and resource constraints, and consequently “left undone”, “missed” or “implicitly rationed” (Kalisch, 2009, Papastavrou et al., 2014, Schubert et al., 2008). The highest priority activities for nurses are those which, if omitted, are likely to have immediate negative consequences for patients’ physical health, such as administering

medications on time providing medically directed treatments, and undertaking procedures such as wound dressings. Patterns of unfinished care are consistent with the subordination of teaching and emotional support activities to those related to medical treatment needs and organisational audits (Ausserhofer et al., 2014). International studies (55-98%) report most nursing personnel leaving at least one task undone (Jones et al., 2015). Delegation to unlicensed care assistants has also been associated with missed nursing care (Bittner et al., 2011). Many of the care tasks nurses or patients report as being left undone have a physiological link to the four complications as outlined in Table 2.

Insert Table 2 Care reported as missed/omitted/rationed, by nurses or patients, and related to the four key complications.

Implicit care rationing by nurses can lead to functional and cognitive decline, which are preventable risk factors for the development, or 'cascade', of complications for complex older patients (Parke et al., 2013). It is not simply one injury, or a single, adverse 'event', but a series of mild cases of neglect, missed opportunities and missed red flags (Potts et al., 1993) that produce a cascade of iatrogenesis (Thornlow et al., 2009). The intrinsic risk factors for older people with complex health needs are outlined in Table 3. These risk factors can be assessed, and risk minimised, by nurses, managers and hospitals.

Insert Table 3. Intrinsic risk factors that may contribute to risks associated with the four key complications

1.3 Functional and cognitive decline can be explored with nurse care rationing

The example of functional decline is used to illustrate the complex nature of cascade iatrogenesis. Functional decline is experienced by 30-60% of the older hospitalized patients, resulting in decreased independence and other adverse health outcomes (Hoogerduijn et al., 2014). For example, in one study, 70% of older ambulatory patients did not walk during separate three hour study periods (Callen et al., 2004). It is known that mobility enhances lung expansion, promotes circulation, facilitates normal bowel and urinary habits, and is emotionally beneficial. It has also been found that patients who are mobilised earlier in the Intensive Care Unit (ICU) are half as likely to develop cognitive impairment, in the form of delirium (Schweickert et al., 2009). All of these physiological and mental processes of mobility are known to have a role in the reduction of patient risk of pressure injuries, pneumonia, urinary tract infections and delirium (Table 1). However, mobility can be missed in up to 85% of cases (refer to Table 2). Another example of preventing cognitive decline in hospital involved a prospective randomised controlled trial, where the intervention involved nurses spending 20 minutes of orientating communication including discussing current events, recalling past events and actively engaging participants. The patients improved in cognition during hospitalisation, rather than declining in the control arm (Cheng et al., 2012). Yet, communication and health teaching with patients is missed in up to 80% of cases (refer to Table 2).

Due to their ability to observe and guide patients and their 24-h patient supervision, nurses should play a key role in strategies to prevent functional and cognitive decline (Hoogerduijn et al., 2014). However, the strategies to prevent functional and cognitive decline are the care activities most often missed by nurses.

2. Method to develop this paper

The key premise of this paper is the theoretical proposition of a conceptual framework to identify implicit nurse care rationing that contributes to the nurse-sensitive complications of urinary tract infections, pneumonia, pressure injuries and delirium in the hospitalised older patient. Methods used to analyse the literature in order to arrive at the framework proposed included using hand searched articles and computerized database searching on Google Scholar and Web of Science during 2007 to 2015. It should be noted that this literature collection is based on reference snowballing, as 'nurse sensitive' combined with 'ageing' or 'dementia' or 'older person', or 'older people' 'gerontology' 'aged care' and other similar key words raise limited findings. This indicates that 'nurse sensitive' is not yet a common phrase for quality measures in this population. There is increasing prevalence of research into nurse-sensitive quality indicators in acute and subacute aged care settings, and in 2012 the rate of publications in the hospitalisation and dementia injury was ten times higher than in previous years (Hofmann, 2013). This paper aims to improve the understanding of what nurse-sensitive indicators are developed in hospital care for complex older populations, including those with dementia.

This paper uses a narrative analysis of acute care literature to develop a conceptual proposition. Section (1) has already described the background to the focus of the paper, regarding the hospital complications for people with complex needs in hospital, the emerging evidence that nurses are implicitly rationing their care, and the link that functional and cognitive decline occurring during hospitalisation offers to link these two phenomena. The following sections provide context for the current situation through (3) the historical and contemporary developments in the role and function hospitals and nursing in the last 30 years; and then (4) discussion about how these developments have created the need for patients to efficiently 'flow' through hospitals. Section (5) then describes how complex older patients 'slows the flow' of patients through hospital. How nurses work to increase flow, and the unintended risks associated with these practices for complex older patients is discussed. This leads into the proposition of 'Failure to Maintain' as a conceptual framework with measurable indicators (6), and how this fits with other frameworks such as Failure to Rescue, and 'implicit care rationing' development. Section (7) then examines how prevention of urinary tract infections, pressure injuries, pneumonia and delirium have been associated with 'Nursing Work Environments' and 'Aged Models of Care'. Section (8) then analyses the ethical considerations regarding this prioritisation of nursing care. In this way, this paper will provide a detailed analysis of current practices in acute care hospitals, which may contribute to the 'Failure to Maintain' complex older patients, and associated poor health outcomes..

3. Historical developments in hospital and nursing roles

3.1 Hospitals have changed over 30 years

A description of current hospital function is necessary to appreciate the context of nursing work. In the last 30 years, hospital care has shifted from younger people with single diseases, to older people with multiple diseases. In 1995-96, the population aged over 65 comprised 12% of the total Australian population, and accounted for 30% of hospital separations (Australian Institute of Health and Welfare, 1997). In 2013-14, the same population comprises 13% of the total Australian population, and accounts for 40% of hospitalisations (Australian Institute of Health and Welfare,

2015). However, the bed days for this population has remained constant at 48% of all hospital bed days during this time (Australian Institute of Health and Welfare, 2015, Australian Institute of Health and Welfare, 1997, Australian Institute of Health and Welfare, 2002), meaning that there are more of this population in hospital than previously, but their length of stay is now shorter. Length of overnights stays has decreased from 7.0 days in 1994-95 (Australian Institute of Health and Welfare, 1997), to 5.8 days in 2011-12 (Australian Institute of Health and Welfare, 2013) creating a value on fast paced healing trajectories that maintain efficient admission and discharge pathways (Heartfield, 2005).

Most people from this older population have accompanying comorbidity, disability, and frailty (Rochat et al., 2010). Additionally, simple surgical patients are increasingly treated in private hospitals (Sammut, 2009), and day surgery (Australian Institute of Health and Welfare, 2013), which further contributes to the profile of patients using public hospital services with increased diagnosis variation, age and acuity of patients in hospital (Jayaprakash et al., 2009); ie older with more complex healthcare requirements. Services offered by the public hospitals have also changed, with decreased acute public hospital beds per population (Australian Institute of Health and Welfare, 2009, Sammut, 2009). Bed occupancy is often higher than 90%, where 85% is considered the safe level (Forero and Hillman, 2008, Sammut, 2009), (Birch et al., 2003, Kuntz et al., 2015).

This focus on efficient length of stay, in conjunction with finding the best location for the patient, increases patient turnover through the hospital, known as 'churn' (Birch et al., 2003, Duffield et al., 2009, Unruh and Fottler, 2006). Patients will on average move between wards at least twice during their inpatient stay (Duffield et al., 2009). The increased specialisation of internal medicine has led to disease-specific expertise in renal, respiratory, cardiac and endocrine medicine that are accommodated in disease-specific ward injuries with specialised nursing care. Hospital admitting criteria and ward spaces are still designed according to the historic notion of a single primary disease, and so finding a suitable ward for someone with multiple co-morbidities becomes challenging (Nobili et al., 2011). To manage all these changes, each hospital has more 'standard operating procedures', in relation to more complex medical treatment regimes, and more frequent 'practice improvement' changes in the form of paperwork changes, procedure revisions and documentation demands (Parke and Chappell, 2010). While the purpose of the increased documentation is to aid patient safety, it may have the opposite effect by reducing nursing time spent with patients (Krichbaum et al., 2007).

3.2 The role and function of nurses in contemporary hospital settings

The workforce providing hospital services has also changed, with an ageing and retiring workforce in hospitals (Australian Institute of Health and Welfare, 2013), translating to higher prevalence of junior nurses with fewer numbers of supervising senior nurses (Garling, 2008). The lack of senior staff is particularly notable during 75% of the week that comprises of nights and weekends (Garling, 2008). Experienced registered nurses are increasingly retiring (Australian Institute of Health and Welfare, 2013), or moving to less clinical, more prestigious roles in hospital administration, which are arguably increasing in prevalence (Sammut, 2009). Registered nurses also have increased supervisory roles of students, enrolled nurses, assistants in nursing, volunteers, carers and doctors (Bail et al., 2009, Department of Health, 2014, Mudge et al., 2013). There is increased casualisation of the hospital workforce, with almost half of the nursing workforce employed in non-standard

capacity (Alameddine et al., 2012, Creegan et al., 2003). While registered nurses (RNs) per capita have increased in line with the population (Australian Institute of Health and Welfare, 2013), the extension of nursing roles and expansion into different settings may have affected the numbers of bedside nurses per capita (Garling, 2008).

Nurses modify patient risk factors through surveillance and intervention (often carried out simultaneously), with direct oversight and surveillance for groups of patients, enabling early detection and timely intervention (Dresser, 2012). Hospital nurses function in this role by multitasking, continuously re-prioritizing work schedules and negotiating competing demands and interruptions. Nurses complete an average of 72.3 tasks per hour, with a mean task length of 55 seconds (Westbrook et al., 2011), and so they manage their competing duties by multitasking 34% of the time (Kalisch and Aebersold, 2010). Additionally, nurses are interrupted by colleagues or patients once every six minutes (Kalisch and Aebersold, 2010), and by work system failures once an hour, primarily involving medications, orders, supplies, staffing, and equipment (Tucker and Spear, 2006). Nurses have a chaotic pace, rarely completing one activity before switching to another; the duration of 40% of nurse activities in one study was less than ten seconds. This multitasking is studied as 'cognitive shifts' or 'stacking', noting that the nurse is considering a different patient every six minutes on average across an 8 hour shift (Ebright et al., 2003, Tucker and Spear, 2006). Each interruption requires a re-prioritisation of nursing activities being 'cognitively re-stacked'. The context for this multitasking by nurses is that within 24 hours, each patient is likely to: be seen by at least three teams of nurses, at least two junior doctors and registrars, and possibly the consultant specialist; have medication prescribed/changed; have results/orders for tests; and have treatment regimens instituted/evaluated. All of these changes will be communicated in up to four ways: clinical notes; multidisciplinary ward rounds; handover within a discipline; and word of mouth in the corridor/desk (Garling, 2008).

This often chaotic working context may limit opportunity to engage in deep critical thinking and analysis (Cornell et al., 2010). However, deep critical thinking is the required, risk modifying intervention of nurses to prevent cascading iatrogenesis. Three decades of research has identified associations between lower levels of Bachelor-prepared registered nurses and higher 30 day patient mortality (Aiken et al., 1994, Cho et al., 2015); and between better nurse staffing and quality of care and lower rates of hospital-acquired complications (Needleman et al., 2001, Needleman and Hassmiller, 2009, Twigg et al., 2015). Effective nursing surveillance is a process through which Bachelor-prepared registered nurses monitor, evaluate, and act upon emerging indicators of a patient's change in status. The components of this process include ongoing observation and assessment, recognition, interpretation of clinical data, and clinical decision-making (Kutney-Lee et al., 2009, Thornlow et al., 2009). The 'simple' interventions (see Table 1) to prevent complications are required in the context of interruptions, multitasking, and work system failures (Tucker and Spear, 2006).

Nurse rationing of certain care tasks has attracted critical feedback such as "it doesn't take a three-year degree to help someone bathe and eat" (Duckett et al., 2014), or even that "University-trained nurses don't want to do this work" (Sammur, 2009). However, in examining the list of nursing activities in tables 1 and 2, nurses use the opportunities to do the fundamental tasks in order to get close to the patient and do assessments (Weinberg, 2006). This closeness – in terms of walking a patient to the bathroom to toilet or shower, or helping them to eat a meal – is used by the nurse to

observe and interact with the patient in complex ways, including education and teaching. Similarly, there is description of the 'soft skills' such as 'chit chat' that the doctors relegate to the nurses (Skirbekk and Nortvedt, 2014) which overlooks these items as the 'teaching and communication' care that can act as a prophylactic intervention. Eighty percent of errors that initiated cascades of mismanagement in diagnosis and treatment involved informational or personal miscommunication (Woolf et al., 2004). Recognition of the components of communication, including development of patient-nurse therapeutic relationships, is particularly key to nursing work when the 'simple' interventions' (see Table 1) take place in the context of interruptions, multitasking, and work system failures. University education of registered nurses, and/or specialist geriatric training, may offer an adaptive and protective function in delivering these simple interventions for complex patients in complex situations.

Effective nurses are described as 'bricoleurs' — knowledgeable in many injuries and adept at performing multiple, diverse tasks, and use whatever resources are available to deal with the known and unknown (Kirkpatrick 2014). Benner (1984) describes the 'expert nurse' as one who grasps clinical situations as a whole, utilises extensive pattern recognition skills, is able to make fine distinctions, anticipate problems and intervene before they occur (Dresser, 2012). Nurses in acute hospitals consider patients to be "always at risk"; thus "keeping patients safe was a continual, repetitive process of managing risk to prevent harm to patients" (Groves et al., 2014). The expertise of nurses is based on their ability to negotiate the system to protect patients from risks; but some risks are more invisible, or more distant, than others (Borbasi et al., 2006, Skirbekk and Nortvedt, 2014). Even when workload is not high, nurses have become so accustomed to the busy chaos associated with contingencies and interruptions that they continue functioning by implicitly rationing nursing services (Kalisch, 2006, Kalisch, 2009). Nurse care rationing is a phenomena internationally (Jones et al., 2015) as demonstrated earlier, in Table 2.

4. The focus on patient flow by hospitals in relation to care rationing by nurses

Hospital performance is focussed on efficiency and effectiveness, which is reinforced by funding through key performance indicators. Efficiency indicators are the relationship of inputs to outputs; the main key performance indicators for Australian hospitals are surgical waiting times and time spent waiting in emergency departments for a hospital ward bed. These waiting time performance measurements require the prioritisation of patient flow, and the associated need for short length of stays to make beds available for surgical and emergency patients coming through the system (National Health Performance Authority (NHPA), 2012). Nurses and doctors, as the key providers in hospital, make efficiency happen. Nurses' and doctors' decisions about which care to prioritise and which to omit consider what aligns with the hospital requirements. 'Patients who fit best with the assembly line are given highest priority' (p234 (Pedersen et al., 2013). Bed managers are appointed to move as many patients through the hospital admission period as possible (Allen, 2015, Holland et al., 2012). Patient flow is advocated as a means to achieve hospital efficiency and effectiveness, in order for health services and governments to be accountable to tax payers for providing sound service provision (Fineberg, 2012).

Hospital administrators are under pressure to reduce waiting times and costs, and a primary strategy focuses on optimising the flow of hospital patients to relieve emergency department overcrowding (McHugh et al., 2011, Silvester et al., 2014). For nursing this means that in the last thirty years,

nurses' responsibilities have shifted from making beds, to administrating beds (Heartfield, 2005). The nurses are responsible not just for the patients in the beds, but also for the next patients who are waiting for those beds to become available. Senior nurses and those whose title is 'bed management' or 'patient flow' do daily patient inventory to see who is ready to be discharged, and if not, why not (Allen, 2015). This has a utilitarian purpose that reinforces the privileged position of patients with fast paced healing trajectories.

It has been noted elsewhere that biomedical criteria seem to outrun ethical considerations (p234 (Pedersen et al., 2013), and that the acutely ill have priority before the chronically ill (Skirbekk and Nortvedt, 2014). In the context of promoting the flow of patients through the system, nurses' lowest priorities are the activities for which the required time-effort-value is difficult to estimate, such as psychosocial care, planning and documenting care (Ausserhofer et al., 2014). In contrast, the highest priority activities for nurses are those which, if omitted, are likely to have immediate and obvious negative consequences for patients' physical health, such as administering medications on time (Ausserhofer et al., 2014) pp133). These perspectives translate to a 'disappearance of recovery time' (Heartfield, 2005). Clinicians' value 'making a difference' for patients, but this 'difference' is primarily enacted through *medically* sound decisions (Skirbekk and Nortvedt, 2014). Nurses and doctors reported giving elderly patients lower priority, too many interventions and too many drugs, with too little care and comfort, and described this as an unwanted, yet frequent, occurrence (Skirbekk and Nortvedt, 2014).

Nurses appear to be using in-hospital triage to manage limited ward resources to deliver patient care. In the context of promoting patient flow, those activities that clearly align with the healing trajectory (and discharge) are prioritised over other activities, such as mobilisation. This may lead to a perverse effect, whereby organisational achievement of effectiveness indicators for outputs of a health service (patient flow/throughput) incentivise actions with an immediate effect (discharge) over those that could prevent hospital-acquired complications (injury), paradoxically increasing hospital-acquired complications and length of stay for complex older patients. It even appears that the prevention of death and accumulation of chronic illness (Sammut, 2009) may be creating a social situation of 'mass casualties', which is triggering the use of 'disaster triage'. Disaster or mass casualty triage is where patient needs overwhelm immediate capabilities at the expense of treating other patients, and determination is made to optimise care for the maximum number of salvageable patients (Mor and Waisman, 2002). In this case, the 'unsalvagable' patients are the ones with conditions that are incurable by the acute hospital service; namely complex older patients with multiple chronic comorbidities (Skirbekk and Nortvedt, 2014).

5. Complex older patients slow the flow, with associated risks to older people.

Rationing of care is based on predictable patient flow. As indicated in Figure 1, complex older patients, such as patients with dementia, slow that flow. Derogatory nomenclature, such as 'bed blockers', 'social admissions' and 'acopia', express a perception that older patients hinder patient flow (Brown et al., 2011, Parke and Chappell, 2010, Oliver 2008). As indicated in the previous sections, the most time-consuming and least life-threatening care tasks are more likely to be omitted, and this is likely to affect health outcomes for complex older patients (Borbasi et al., 2006, Skirbekk and Nortvedt, 2014).

Insert Figure 1.

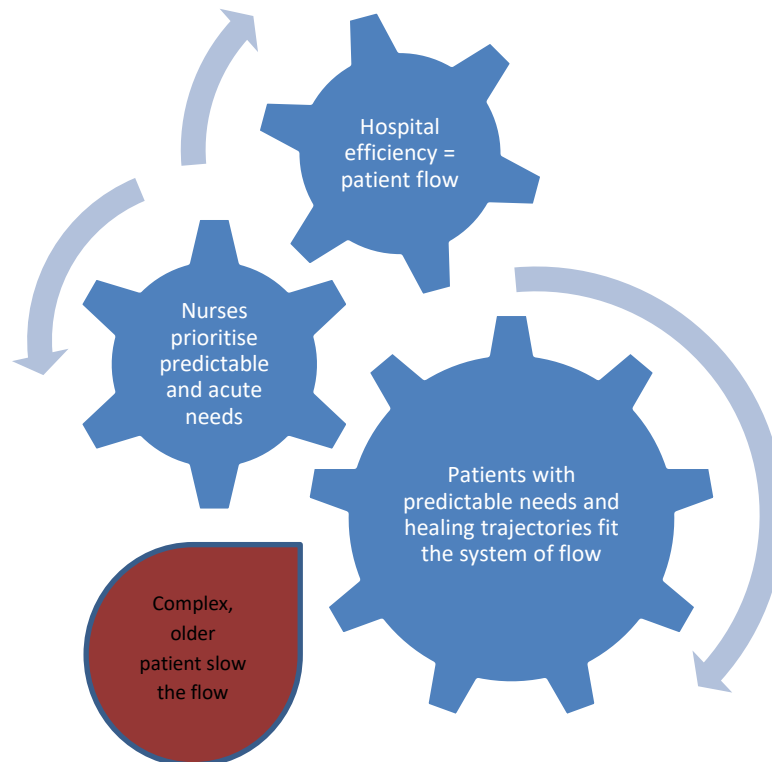


Figure 1. Complex older patients slow the efficiency of patient flow in hospitals

Using the person with dementia as an example, because they usually presents with a diagnosis other than dementia (Draper et al., 2011), how the risks to older complex older patients arise is illustrated next. Due to the effects of dementia on cognition, the person is likely to have limited understanding about being in hospital and limited ability to self-care and therefore is more likely to have higher fundamental care needs, requiring more nursing time. Older people with dementia may have communication difficulties and sensitivity to environmental changes, making personal care tasks more time consuming and unpredictable (Parke et al., 2013). Specifically to older adults with dementia, nurses acknowledge that they neglect basic care needs such as nutrition, hydration, toileting and mobility: “You’re dividing your time and prioritising. When you’re spending time with one patient, you’re ignoring the others” (p1213 Parke et al., 2013).

In this context of prioritisation and nursing work environment, ‘unintentional tolerance’ or ‘benign neglect’ of functional decline of older patients may be a bi-product of the pressure on hospital employees to keep up patient flow (D’Ambruso and Cadogan, 2012). Patients expect hospitalisation to improve physical function, yet hospital routines tend to reinforce and normalise ‘lying in bed’ behaviours: “patients may languish in a default position of supine bed rest without intervention by nurses, who may unconsciously regard this position as normative and convenient” (p13 D’Ambruso and Cadogan, 2012).

The intersection of complex older patients’ needs with the complex hospital environment and multi-tasking nurses means this population are more vulnerable to the risks of complications. Older patients are at risk of iatrogenic complications because of their age, comorbidity, and communication, cognition or functional deficits (See Table 3). Older patients may not display classic

symptoms of their diseases or complications, making diagnosis and treatment more difficult (Mudge et al., 2010). While other vulnerable groups, like children, benefit from carers being enabled to stay at the bedside to advocate for them, there are limited facilities and expectations for similar support for older people with complex care needs (Fry et al., 2015).

Insert Table 4. Extrinsic risk factors that may contribute to risks associated with the four key complications

These risks intrinsic to the patient are then combined with the risks associated with any intended medical interventions, and any risks associated with the pace and focus of the hospital system, contributing to the high, yet invisible, vulnerability of older people in hospital (Parke et al., 2013) (See Table 4). For example, the default 'lying in bed' behaviours expected of patients may mask, or contribute to, the complication of hypoactive delirium. Other default acute medical practices such as intravenous lines, catheters, and blood pressure monitors may be 'tethers' that are inappropriate for older confused patients who may benefit more from mobility and normalcy for maintenance and rehabilitation, rather than acute, corrective interventions (Borbasi et al., 2006, Huang et al., 2013). What was a simple act of getting out of bed to go to the toilet becomes a complex dance of tangled lines, errant IV poles, multiple staff members and unfamiliar equipment and surroundings. Patients who are not physically or cognitively able to follow or cooperate with predesigned treatment pathways may also not fit the clinicians' expectations of healing trajectories (Parke and Chappell, 2010), with the prevailing model of acute care less sensitive to their needs (Mudge et al., 2012). Consequently despite complex older patients being the largest population in hospital, and having higher risks for complications, there are many ways – such as care rationing - in which hospitals may paradoxically increase, rather than reduce, those risks.

6. The Theory: Failure to Maintain

Four key complications occur more often in older patients with dementia and the high rate of these complications makes their care expensive. These complications are potentially preventable. However, the care that can prevent them (such as mobility, hydration, nutrition and communication) is known to be rationed or left unfinished by nurses. Older hospitalised people who have complex needs, such as those with dementia, are more likely to experience care rationing as their care tends to take longer, be less predictable and less curative in nature. This paper offers the theoretical proposition that evidence-based nursing practices are rationed for complex older patients and that this rationed care contributes to functional and cognitive decline during hospitalisation. This, in turn, contributes to the high rates of four key complications that are indicators of 'Failure to Maintain' complex older people in hospital. 'Failure to Maintain' is the insufficient delivery of essential nursing care for an older person in hospital resulting in a complication, four of which are useful indicators for the quality of hospital performance.

'Failure to Maintain' extends upon two other fields: implicit care rationing and 'Failure to Rescue' as a quality measure. Research into implicit rationing care has gained traction in nursing since first recognised as 'nursing care left undone' across five countries (United States, Canada, England, Scotland, and Germany) in the late 1990s (Aiken et al., 2001), and then variably as: 'unfinished care' in the United States of America (USA) (Sochalski, 2004), 'implicit care rationing' in Switzerland (Schubert et al., 2008), "care left undone" in Australia (Duffield et al., 2007), 'task incompleteness' in Kuwait (Al-Kandari and Thomas, 2009), 'unmet nursing care needs' (Lucero et al., 2010) and 'missed

nursing care’ (Kalisch, 2009) in the USA, and ‘bedside rationing’ and ‘care left undone’ in Europe (Ausserhofer et al., 2014, Papastavrou et al., 2014). The recent 2015 systematic review of 42 quantitative reports concluded that, whatever it is named, unfinished care is a significant problem in acute care hospitals internationally (Jones et al., 2015). Predictors of unfinished care included perceived team interactions, adequacy of resources, safety climate, and nurse staffing. However, whereas prior research identified that the prioritisation strategies of nurses risk leaving vulnerable patients with “unmet *educational, emotional, and psychological* needs” (Jones et al., 2015), the conceptual framework presented in this paper goes further to theorise that nurse care rationing is failing to maintain *physiological* needs that have measurable, and costly, complications. These term ‘rationing’ best engages other disciplines such as economics, policy and law in the analysis of this phenomena; and ‘implicit’ best describes the prioritisation as indirect and unintentional by nurses and hospitals.

Insert figure 2 here

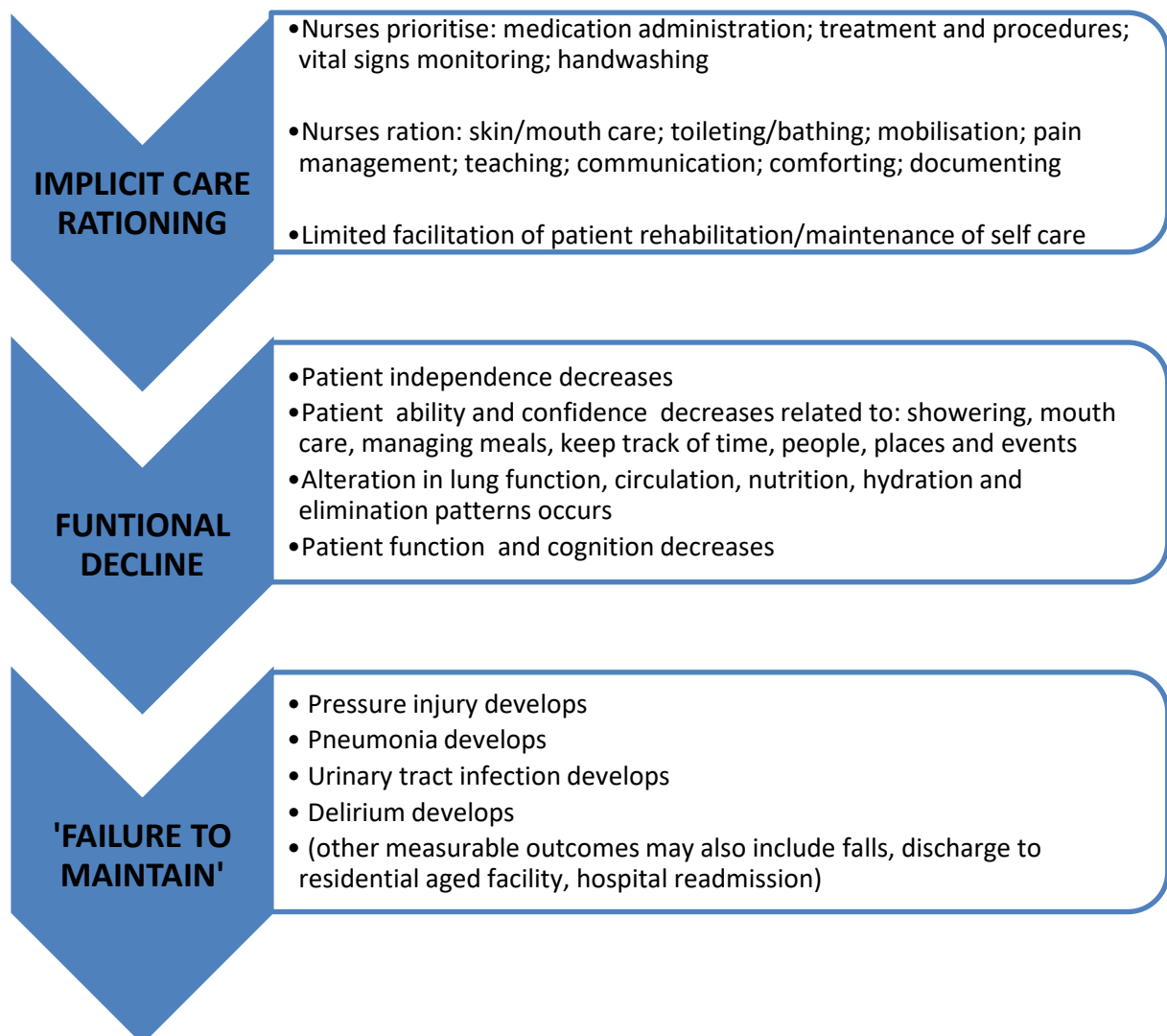


Figure 2. Theoretical proposition developing the ‘Failure to Maintain’ indicators

The second field extended by the 'Failure to Maintain' framework is the well-recognised term, 'Failure to Rescue' (death following hospital-acquired complication). 'Failure to Maintain' was intentionally named to be consistent with 'Failure to Rescue', which is a concept linked with measurable outcome indicators, and has become prevalent in health services monitoring and evaluation (Aiken et al., 2013, Kane et al., 2007, Neff et al., 2013, Sheetz et al., 2014, Twigg et al., 2011). However, 'Failure to Rescue' has tended to exclude patients aged over 75 years (see for example the American Agency for Health Research and Quality at <http://www.qualityindicators.ahrq.gov>). Where studies *have* included people aged over 75 years, this population has higher rates of 'Failure to Rescue', particularly after pulmonary or infectious complications (Sheetz et al., 2014). There have been some tensions in the inclusion of complex older patients in hospital quality outcome measurements, such as 'Failure to Rescue'. Many studies exclude older patients with a perception that assessment of survival was unreasonable (for example, Horwitz et al., 2007) though this does seem to be shifting as researchers identify that there is a wide variation across hospitals, signifying the importance of systems aimed at the early recognition and effective management of complications in this population (for example, Sheetz et al., 2014). Consequently, 'Failure to Maintain' for older patients may be a useful accompanying indicator to 'Failure to Rescue' to monitor and evaluate hospital care of older people as shown in Table 5.

Insert Table 5. Comparing 'Failure to Rescue' and 'Failure to Maintain'

'Failure to Maintain' posits that implicit nurse care rationing leads to hospital-acquired complications. While Figure 2 indicates a relatively simplistic relationship between implicit rationing of nursing care, associated physiological deterioration, and the four hospital-acquired complications in older patients, the implicit decisions to ration care are not made in a vacuum. The interaction between nurses, nursing practice, and the socio-political contexts of contemporary hospitals reviewed in the first part of the paper are important to understand the phenomenon of implicit nursing care rationing. This is depicted in Figure 3, the 'Failure to Maintain' conceptual framework.

Insert Figure 3 here.

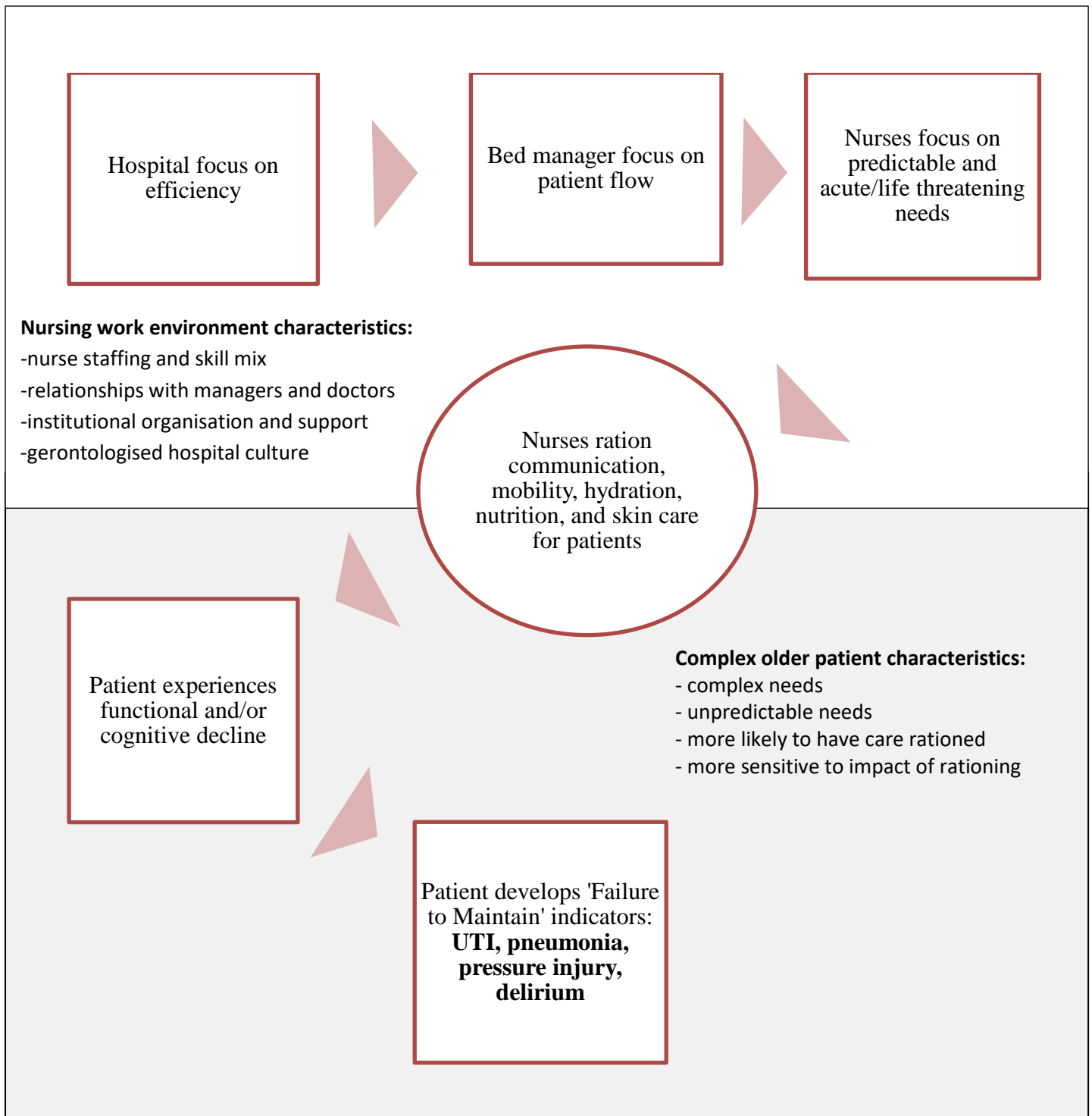


Figure 3. 'Failure to Maintain' conceptual framework

7. Minimising 'Failure to Maintain'

Care rationing, functional decline and complications have been found to be alleviated by nursing and hospital work environments and acute models of care specifically designed for older people (See Table 6). The features of the nursing work environment that are modifiable and known to be associated with positive patient, nurse and institutional outcomes include: nurse autonomy, control, and nurse-physician relationships; flexible scheduling; strong, supportive, and visible nurse leadership; recognition for excellence in practice; participative management with open communication; professional development and career advancement opportunities, and richer nursing skill mix (Aiken and Patrician, 2000, Kelly et al., 2012, Sovie, 1984, Vaughan and Slinger, 2013). Modifiable aspects of the hospital work environment include: effectiveness of communication pathways, bed turnover, unit based support staff, unit cohesiveness, documentation expectations, medication delivery, 24/7 support services, physician relationships, and bedside technology (Rice, 2010). Modifiable aspects of the work environment specific to aged care models include facilitation teams enabling clinicians to focus on patient orientation, nutrition, fluids, sleep, mobility and carer involvement; pathways guiding multidisciplinary ownership of care and discharge; promotion of inter-hierarchical support for supportive infrastructure that supports older patients; and staffing and resourcing of rooms specific for patients with cognitive impairment (Boltz et al., 2008, Chong et al., 2014, Flood et al., 2013, Fox et al., 2012). Featured components of these models include postgraduate education of nurses in geriatrics with a focus on managing multiple comorbidities; and the 'gerontologising' of hospital systems, including patient flow. This work on hospital environments shows that ameliorating nurse care rationing takes more than just quality or quantity of nurses. Development of simple but sensitive indicators of nursing care quality – such as the 'Failure to Maintain' complications - would assist in further understanding and monitoring these characteristics, both at clinical and research levels.

Insert Table 6. Impact of the Nursing Work Environment on outcomes relevant to 'Failure to Maintain' conceptual framework

8. Ethics of nurse rationing.

While models of care delivery will be important to minimise care rationing, it is important to recognise that any form of care rationing decision-making is ethical as well as clinical, and as such reflects and requires broader social context consideration. There are a range of ethical philosophies that may be used to explain the current situation of implicit care rationing of essential care needs. Ethical philosophy about care delivery has focused on a 'universal' range of principles to support decision making – from utilitarianism, to justice, to non-maleficence (See Table 7). 'Justice' in particular is the more commonly considered ethical element of prioritising nursing work in a context of inadequate resources (Page, 2012) however this higher order principle offers little analysis of the process of prioritisation that must occur in health settings. A newer range of ethical interpretations are emerging that focus on the individuality of the patient (see Table 7). These emerging interpretations also reflect the need for self-care by clinicians confronted by an overwhelming number of ethical dilemmas throughout the day (Hem et al., 2014). For example, the term 'rescue ethics' is used to describe the strong emotional element to save those facing death (Papastavrou et al., 2014); which essentially personalises of the concept of triage. Triage is a framework from

emergency medicine that is used to prioritise finite resources (primarily time), by determining patient priority for treatment based on illness severity, and threat to life (Aacharya et al., 2011). The concept introduced in this paper, that nurses are conducting continuous in-hospital triage, will need examination in relation to these philosophical frameworks, and in relation to society's expectations of care delivery.

Insert Table 7 here.

Maintaining patient flow as the underlying reason for rationing care will require social and professional discourse regarding ethical preferences for this social phenomena at a population level; this rationing may not be achieving the utilitarian principle ('the greatest good for the greatest number') that society and clinicians may expect (Aacharya et al., 2011). Organisational or political level discussions/change about the ethics of patient care prioritisations are probably more relevant, and need further development, than the established clinical, bedside level (p234 (Pedersen et al., 2013). Discourse regarding ethical philosophies that allow for population prioritisation need to be explicit, and may aid the sustainability of caring cultures (Gallagher, 2013). This is particularly important if the rationing affects complex older patients more often (Smith, 2016); exploration of ageing and treatment bias related to age are increasingly being investigated (Skirbekk and Nortvedt, 2014).

Recognising that nurses are deciding which essential nursing care to perform and which to omit (Ausserhofer et al., 2014) also highlights important workforce considerations. Nurses across the world face similar issues of high acuity and decreased satisfaction with the quality of patient care (Cheung et al., 2008). In an economic sense, nurses' perceived drop in the quality of care reduces their intrinsic job rewards. As nurses are motivated by the delivery of quality patient care, they are therefore remunerated in satisfaction: decreased satisfaction is the equivalent of a pay cut (Eggert, 2013). The moral distress that arises for clinicians who make these prioritisations for the 'greater good', may not be practising in patient focused ways (Borbasi et al., 2006, Edberg et al., 2008), which has implications for job satisfaction, turnover and recruitment (Khamisa et al., 2015).

Insert Table 7 – Summary of guiding prioritisation philosophies for nurses making implicit care rationing decisions

Ultimately there is a troubling paradox in exploring 'Failure to Maintain': that the largest population in hospital – the complex aged – is the one that doesn't 'fit' or 'belong' in the 24 hour acute hospital environment as it is structured now. In a climate of efficiency, it is concerning that nurses, as the largest and most expensive population of health workers, costing 27% of public hospital operating costs and 44% of salaries and wages expenditure (Australian Institute of Health and Welfare, 2010), have remarkably limited consistently-collected quality hospital or unit-level data describing their work. Public hospitals comprise the largest component of the Australian federal health care budget, at around 30% of the \$103 billion spent on health care services in 2007/2008 (Australian Institute of Health and Welfare, 2008, Australian Institute of Health and Welfare, 2009). Consequently the intersection of these three populations/settings – complex older patients, nurses, and hospitals – warrants significant attention to examine the efficiency of care and quality of outcomes. The new contribution of the 'Failure to Maintain' conceptual framework offers explanation of the complexities related to caring for the elderly, the consequences of rationing of care in the older patient, and offers a method for quality indicator monitoring through the collection of hospital discharge data on four key complications that are sensitive to nursing.

Conclusion

In summary, at the turn of the 21st century, hospitals are designed for high turnover of patients requiring specialised medical treatment. However, up to 50% of people requiring hospital services are older and have complex, chronic illness and this does not fit contemporary hospital design. Nurses conduct their surveillance and intervention of patients by multitasking in an interrupted and continually reorganised and chaotic work pace. Hospital managers have tended to adopt throughput to achieve the efficiency and effectiveness requirements established by governments and ensure continued funding. Clinicians are expected to practice in ways that keeps the flow moving. Care tasks are prioritised to address immediately visible, medically-related risks over more less visible and time-consuming essential care activities. The ethics of nurse prioritisation in this context is a kind of 'in-hospital-triage', where functional and cognitive maintenance care activities for complex older patients have consistently low priority and are often missed or not done.

This paper proposes that attention to nursing work environments in hospital is required to address the risks of hospital-acquired injury in complex older patients. The 'Failure to Maintain' conceptual framework provides quality indicators for monitoring and evaluating hospital performance. In the same ways that 'Failure to Rescue' has opened up new lines of investigation into clinician practice and hospital policy in acute care institutions, 'Failure to Maintain' provides a framework for new lines of investigation into clinical practice for the care of **complex older people** in hospitals.

Limitations

Consideration of the four complications may be useful at unit, hospital and regional level as they are potentially meaningful, measurable, comparable, and modifiable as quality indicators (Australian Commission on Safety and Quality in Health Care, 2011). Other measurable outcomes may also include falls, medication related events, discharge to residential aged facility and hospital

readmission, however these are less easily captured in standard data collection, and are not as well established as nurse-sensitive. The Needleman suite, as used here and which uses DRG patient medical record coding may be useful to measure the four outcomes (Needleman et al., 2001), however, there are also newer methods that also include 'condition onset flags' (Jackson et al., 2009) that may offer better accuracy. Of note is that functional decline during hospitalisation is probably a more useful process measure, but the four selected complications are consistent with current outcome measurement approaches already established at hospital and state levels. For example, delirium would be the only addition to the Western Australian outcome indicator suite for monitoring public patient safety (Twigg et al., 2015).

Recommendations for further work

In order to determine care rationing and evaluate hospital efficiency, implicit rationing should be made explicit (Duckett et al., 2014), and perhaps even part of undergraduate nursing curricula (O'Connor, 2014). Since rationing can never entirely be avoided, it is important to define the threshold above which rationing negatively affects outcomes (Schubert et al., 2008). However, finding ongoing associations between work environment, nurse-sensitive patient outcomes and missed nursing care is tempered by equivocal results, unclear conclusions, methodological incompatibility for meta-analysis and use of predominately cross-sectional designs (Stalpers et al., 2015), so ongoing work to refine the science is needed. The recent establishment of the 'international network for the study of rationalised nursing care' may be a strong enabler of further research in this field (Jones et al., 2014). Reliable reporting of nurse staffing at the patient level would be also beneficial to this science, perhaps in the scope of 'Health Roundtables' or other voluntary membership organisations that offer benchmarking of care quality and outcomes (Chaudhry et al., 2012).

Current research in the fields of both acute geriatrics and nursing work environments show promise in investigating the contributing factors to 'Failure to Maintain' patients with dementia. However both fields would benefit from better integration. For example, acute geriatrics research could include the risk modification role of nurses; and nursing work environment research could recognise the different profile of patients with dementia, and complex older patients. Investment in nursing research surrounding these complications would be valuable. In particular; comprehensive research programs are needed in order to evaluate effectiveness of nursing prevention of the four complications. Other large projects could include prospective studies on missed care and patients with dementia. Systematic analysis of the 'cascade iatrogenesis' framework to investigate the pathophysiology of the four complications in relation to nursing care would be invaluable. More research on the relationship between increased age, severity of illness and nursing workload has also been flagged as significant but strangely absent in the last 20 years ((Mion et al., 1988, Pearson et al., 2006). The paucity of studies assessing the relationship between unfinished care and patient acuity using more sensitive measures, such as commercially available nursing acuity systems or the nursing intensity weights mapped to DRGs, needs to be rectified (Jones et al., 2015). More definitive research to know whether registered nurses actually want to 'do this work', and whether it's more expensive for registered nurses or less educated nurses to 'do this work' would be informative, but politically charged.

However, as identified earlier, these four complications can be used by nurses and managers at ward, hospital and regional levels, and can feedback real-time data to bedside clinicians. Consequently, immediate change at clinical levels is possible, based on models currently in practice. Based on the 'Failure to Maintain' framework, no further wait for further research is necessary for managers and bedside nurses wanting to implement strategies known to decrease the four complications (Table 2); and attempts can be made to decrease nurse care rationing of maintenance care to complex older patients (see Table 1). The greatest barrier these models of care and intervention have faced in achieving long lasting care change for complex older patients is: support at all hierarchical levels, and succession planning to maintain the champions and evidence-based practice (for example, (Mudge et al., 2013).

Higher level public policy incentives will be necessary to implement and maintain ongoing delivery of evidence-based nursing practice for complex older patients in hospital. The recent 'national set of high-priority hospital complications' (Australian Commission on Safety and Quality in Health Care, 2013) do include the four complications which is promising. Increasing the ability of instruments to identify functional ability such as Integrative Measure of Functioning (Madden et al., 2015), and their place within hospitals may be possible. However, the role of nursing needs consideration in relation to these developments; for example, the pressure injuries are identified at stages I-IV in the 'national set of high-priority hospital complications', yet only doctor documentation is included in medical record coding of ICD-10. Most early stage pressure injuries will be documented by nurses long before it warrants notation in medical documentation. Current models of 'activity based funding' and 'quality reporting frameworks' and 'National Safety and Quality Health Service (NSQHS) Standards may miss the kinds of details that would highlight opportunities for improving nurses and hospitals abilities to prevent these complications.

In conclusion, despite complex older patients being the largest population in hospital, acute care environments are not well suited to their needs. 'Failure to Maintain' is the failure to prevent avoidable hospital-acquired urinary tract infection, pressure injuries, pneumonia and delirium. 'Failure to Maintain' provides a framework for conceptualising how implicit nurse care rationing of basic and essential cares of mobility, communication, skin care, hydration and nutrition leads to functional and cognitive decline in complex older patients, which in turn may lead to these measurable hospital-acquired complications. The high cost of these complications (Bail et al., 2015) should offer ongoing incentive for enabling prophylactic intervention, not to mention the duty of care to prevent patient suffering.

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Table 1. Effective preventative nursing interventions for the four key complications (as individual interventions or components of a 'care bundle')	
Urinary Tract Infection	Delirium
<p>Increase fluid intake Good hygiene Stable blood sugars Promote complete bladder emptying Avoid catheterisation (maintain continence, minimise soiling) Timed voiding (toilet visits only taking place at pre-determined times) Improve mobility (walking aids, handrails, commodes, assistance) Keep toilet environment uncluttered, leave door open for easy access Use of absorbent products and barrier creams to maintain skin integrity Nurse-directed urinary catheter removal protocol Biweekly catheter and infection rate feedback Nurses to remind physicians which patients have a catheter Education focus on unlicensed personal what to report to the nurse Always check the entire catheter system, maintain a closed system Keep bag below the bladder, secure catheter, daily urethral meatal care Use clean technique when handling the catheter Sterile technique for insertion</p>	<p>Encourage drinking, consider intravenous fluids if necessary Assess for hypoxia and optimise oxygen saturation if necessary Encourage mobilisation, range-of-movement activities Look for and treat infection Introduce cognitively stimulating activities (for example, reminiscence) Facilitate regular visits from family and friends Screen for risk factors, team practices and protocols for detection Reduce ward and bed changes Personal care (pain, nutrition, hydration, continence, mobility, skin care) Environmental interventions (temperature, lighting, hazards, noise) Provide a clock and a calendar Reorientate the person (where they are, what is happening) Enable patient free movement Ensure patients eat and drink appropriately, food and drink accessible Minimise unnecessary medications and interventions (eg catheters) Maximise sleep (minimise interventions, medication rounds) Minimise sensory impairment (hearing, visual, dental aids)</p>
Pressure Injury	Pneumonia
<p>Daily risk assessment (skin, mobility, nutrition, hydration, age, comorbidities) Pressure reduction mattresses 2 hourly repositioning (with sound reminder for nurses) 30 degree tilted side lying position Elevation of heels with pillows along the calves Draw sheets (to prevent friction and shear) Skin cleanser, moisturiser, barrier creams used Information sharing; protocols, education, monthly rates Strengthen integrity of the skin (hydration, nutrition, circulation) Reduce skin exposure to moisture (continence, spills, drying after bath)</p>	<p>Mobilising (sitting out of bed, walking, lung expansion exercises) Pain assessment and management Comprehensive mouth care Screening for swallowing ability Tube feeding protocols Elevation of head of the bed Adequate nutrition Blood glucose stability Hand hygiene Sedation control</p>
<p>Table 1 References: Inouye 1996, Inouye 2000, Godfrey 2012, Mudge 2013, Bardsley 2013, Fink 2012, Salamon 2009, Saint 2005, Parry 2013, Gray-Siracusa 2011, Allen 2013, Soban 2011, Quinn 2013, Rello 2012, Litherland 2011, Shea 2002.</p>	

Table 2. Nurse self-reported missed, omitted or rationed care in relation to UTIs, pneumonia, delirium and pressure injury							
Patient needs ^	Nursing care tasks	Percentages reported omitted	References	Associated with complications			
				UTI	Pneum	Del	PI
Protect integument	Skin care	7-63%	1,2,3,4	*			*
	Mouthcare/oral hygiene	18-82%	1,2,3,4,6,7		*	*	
	Patient bathing	11-63%	2,3,6	*	*	*	*
Eliminate waste	Toileting assistance	11-70%	2,3,5,6	*		*	*
Eat and drink	Facilitate hydration and nutrition	15-76%	2,3	*	*	*	*
Move and maintain postures	Ambulation	29-84%	1,2,6,5	*	*	*	*
	Turning	16-82%	2,5				*
	Effective pain medication	10-83%	1,2,7	*	*	*	*
Avoid dangers	Glucose monitoring	26%	2	*		*	*
	Vital signs	17-38%	1,2,7	*	*	*	*
	Answer call light	9-66%	1,2,5,6	*		*	*
	Adequate hand washing	13-30%	2,5	*	*	*	*
Communicate	Documentation of care	15-47%	1,3,4,5,7,8	*	*	*	*
	Teach patients and family	9-80%	1,2,3,4,5,7,8	*	*	*	*
	Comfort/talk with patients and family	27-66%	1,2,3,4,5,7,8	*	*	*	*
UTI = urinary tract infection Pneum = Pneumonia Del = Delirium PI = Pressure injury							
^ Henderson 1955.							
Table 2 References. 1. Duffield 2007, 2. Kalisch 2009, 3. Al-Kandari 2009, 4. Lucero 2010, 5. Schubert 2013, 6. Kalisch 2006, 7. Ausserhofer 2014, 8. Ball 2014							

	Patient behaviour	Risks	References	Potential cascade to complication			
				UTI	Pneum	Del	PI
Cognitive impairment	Wandering	Leaves hospital, gets lost, may prompt use of restraints, or accept low mobility	1			*	
	Agitation	Pulls out oxygen, intravenous lines, catheter lines	1	*	*	*	
	Unable to communicate needs	Can't communicate pain, toileting needs. Symptoms not identified and treated	1, 2	*	*	*	*
	Misinterprets visual and auditory cues, aggression	Resists staff assistance (interpreted as threat) may prompt use of restraints, or accept low mobility	1, 2, 3		*	*	*
	Decreased inhibition of inappropriate behaviours	Behaviours inconvenient in the clinical space, may prompt psychoactive medications	1			*	
	Confusion, Unable to follow directions	Can't find toilet, doesn't recognise thirst, forgets to eat, doesn't do deep breathing exercises	1, 4	*	*	*	*
Functional impairment	Slower, self care may depend on routine and home environment	Left undone, or done by care staff (deskilling patient)	5	*			*
	Atypical physical signs (eg no temperature with infection)	Symptoms not identified and treated	6	*	*	*	*
	Lower physiological reserve	Overtreatment, higher side effects, decreased mobility, altered intake/output	7	*	*	*	*
Table 3 References: 1. Capetuzi 2011, 2. Parke 2014, 3. Kneafsey 2012, 4. Dewing 2014, 5. Pryor 2010, 6. Mitty 2010, 7. Skirbekk 2012.							

	Hospital setting/practice	Risks	Reference	Potential cascade to complication			
				UTI	Pneum	Del	PI
Physical environment factors	Nowhere to walk to or around	Decreased mobility, increased confusion	1	*	*	*	*
	Infectious patients, contaminated surfaces	Increased exposure to infectious organisms	2	*	*	*	
	Lack of clear access to toilet, access to toilet paper	Increased confusion, increased incontinence, constipation	2, 4	*		*	
	Unpleasant smells, sights, sounds, difficult containers	Limited/disrupted access to food and drink, decreased input	2		*	*	*
	Difficult to find mobility aids, lifters	Limited mobility, skin injury	5	*		*	*
	Physical obstacles in the environment	Decreased mobility, increased confusion	1, 2	*	*	*	*
	Noise, lighting	Increased confusion, decreased rest and sleep	4, 6			*	
Process factors (treatment and regimes that may affect the patient)	Altered pain management	Decreased mobility, decreased lung expansion, skin injury	1, 4	*	*	*	*
	Altered fluid intake	Altered input and potentially output	4	*	*	*	*
	Altered urinary and bowel habits	Altered output and then potentially input	4	*		*	*
	Altered hygiene habits and practices	Increased exposure to infectious organisms	4	*	*		
	Personal routine altered to hospital routine	Increased confusion, altered output	2, 4	*		*	*
	Medication changes, delays, errors	May alter input/output, increase confusion, decrease mobility	1, 2	*		*	
	Limited assistance with eating/drinking	Limited access to food/drink, altered hydration/nutrition	2	*	*	*	*
	Altered supportive aids	Decreased mobility/confidence, increased confusion	5, 7	*		*	*
	Bed rest without medical/surgical indication	Decreased mobility	8, 9	*	*	*	*
	Tethers' (intravenous lines, catheter lines, monitors)	Decreased mobility, increased confusion, increased exposure to infectious organisms	4, 10	*	*	*	*
	Social pressure to perform task immediately	Task done by carer, deskilling patient	5, 7			*	*
	Nurses may be unintentionally tolerant of functional decline	Decreased mobility, Task done by carer, deskilling patient	8			*	*
	Default position of supine bed rest	Decreased mobility, decreased lung expansion, skin injury	8		*	*	*
	Emphasis on patient safety and falls prevention	Decreased mobility, Task done by carer, deskilling patient	2		*	*	*
	Patients with high care needs delegated to less educated carers	Decreased mobility, Task done by carer, deskilling patient, decreased rehabilitation therapy	7		*	*	*
	Sleep, pain, sensory and functional status not seen as clinically relevant	Decreased assessment, intervention and evaluation of care	4		*	*	*
References: 1. Capetuzi 2011, 2. Mudge 2012, 3. Botlz 2011, 4. Fernandez 2008, 5. Schoenfisch 2011, 6. Dewing 2014, 7. Kneafsey 2012, 8. D'Ambruoso 2012, 9. Borbasi 2006, 10. Ettinger 2011.							

Table 5. Comparing 'Failure to Rescue' and 'Failure to Maintain'			
Needleman's Nurse-Sensitive Outcomes	Failure to Rescue*	Failure to Maintain	Surgical Only
Urinary Tract Infection		+	
Delirium		+	
Pressure Injury		+	
Pneumonia	+	+	
Gastrointestinal Bleed	+		
Sepsis	+		
Shock/Cardiac Arrest	+		
Deep Vein Thrombosis			
Surgical wound infection			+
Pulmonary failure			+
Phys/met derangement**			+
*Death following one of the associated complications			
**Phys/met derangement = physiological or metabolic derangement, eg fluid and electrolyte imbalance			

Table 6. Impact of the Nursing Work Environment on outcomes relevant to 'Failure to Maintain' theory

IMPACT OF:	Characteristics of nursing work environment studied	Outcomes examined and effect (only outcomes conceptually related to Failure to Maintain included)	Ref's
ENVIRONMENT ON IMPLICIT CARE RATIONING	Adequacy of staffing and other resources	Associated with lower reports of unfinished care	1, 2, 3, 4, 5, 6
	Teamwork and collaboration	Associated with lower reports of unfinished care	4, 6
	Teamwork, leadership, autonomy, communication about patients	Accounted for 18.4% of the variance in care rationing	7
	Staff on units > 25 beds	Reported more unfinished care	8
	Registered nurses	Reported more unfinished care than nurse assistants	2,6,9,10,11,12
MISSED CARE ON PATIENT OUTCOMES	Staff in Magnet hospitals report	Reported less unfinished care (controlling for staffing differences)	3
	Unfinished care (ambulation, assessment, call light response, toileting)	Associated with increased patient falls	11
	Implicit rationing of nursing care	Predicted decreased patient satisfaction, increased medication errors, bloodstream infections and pneumonia	13
NURSING WORK ENVIRONMENTS ON PATIENT OUTCOMES	Implicit care rationing	Predicted higher levels of pressure injuries	14
	Care in a hospital with good versus work environment*	Associated with odds of readmission that were 10% lower for pneumonia patients.	15
	Nurses who reported favourable work environments*	30% less likely to report fair to poor care quality	16
	Nurses working in better work environments*	36% to 41% less likely to report that health care-associated infections occurred frequently.	17
	Collaborative relationships between nurses and physicians#	Associated with fewer falls and fewer pressure injuries	18
	Team relations, unit management, organizational support*	Associated with the nurse-assessed unit level quality of care	19
	A decrease in: nursing staff, nurse-physician collaboration, management that listens/responds, timely patient-care plans*	Associated with decreased: quality of care, psychosocial attention, confidence in patient discharge care ability	20
	Hospitals with better nurse work environments*	Associated with 50% lower odds of mortality than in hospitals with mixed or poor nurse work environments	21
	Magnet recognition #	Associated with higher: quality work environments, lower: 30 day mortality, failure to rescue rates	22
MODEL OF ACUTE AGED CARE ON PATIENT OUTCOMES	Patients treated in Magnet hospitals #	Associated with 14% lower odds of mortality and 12% lower odds of failure-to-rescue	15
	Veterans in facilities with better nurse work environments *	17% more likely to rate care as excellent, & report concerns listened to, desired treatments given	22
	Acute care of elders' (ACE) unit geriatric unit care ~	Associated with fewer: falls, delirium, functional decline, discharges to nursing home, costs; shorter length of stay; more discharges to home; trend toward fewer pressure injuries	23
	NICHE^ implementation	Associated with increased nurse perceptions quality of practice environment and geriatric care	24
	Clinical team enabled to recognize barriers, develop solutions, focussing on early mobilization, feeding assistance, and cognitive stimulation	Improved nursing documentation, improved performance of mobilizing and cognitive strategies, reduced length of stay by 3 days	25
	Hospital Elder Life Program (HELP) ^^	Associated with improved delirium, functional decline, patient and family satisfaction, visibility for geriatrics, and quality of care.	26
NURSE STAFFING ON PATIENT OUTCOMES	Interventions adapted from HELP ^^	Decreased delirium by 40%, decreased length of stay by 2 days	27
	Higher RN direct hours per patient day	Associated with patient/relatives reporting excellent care, attention and emotional support	22
	Implementation of GMU ^^ specialized five-bedded unit for acute delirium, uses evening light therapy to consolidate circadian rhythms	Increased: functional ability retention, patient/carer satisfaction. Decreased: length of stay; restraint use; antipsychotic dose; pressure injuries, nosocomial infections, incidence and length of delirium	28
	Each additional patient per nurse in the average nurse's workload	Associated with a 6% higher readmission rate for pneumonia patients	15
	The addition of each patient to a nurse's workload	Associated with a 4% increase in the odds on nurses reporting quality of nursing care as fair	16
	Higher levels of nurse education	Associated with fewer falls	18
	Lower levels of nursing experience were	Associated with higher rates of falls and pressure injuries	18
	Lowering the patient-to-nurse ratios (having 1 less patient per nurse)	Improves (10%) patient outcomes in hospitals with good work environments (using PES-NWI)	29
	Lowering the patient-to-nurse ratios	Improves (4%) patient outcomes in hospitals with average environments (using PES-NWI)	29
	Lowering the patient-to-nurse ratios	Has no effect in hospitals with poor environments (using PES-NWI)	29
Higher levels of burnt out nurses	Associated with higher rates of urinary tract infections	30	
Higher levels of total nurse staffing	Associated with lower rates of urinary tract infections	31	
Higher proportions of RNs, Higher RN hours per patient day	Associated with lower rates of pneumonia	21,32,33,34	

	Refined staffing model	Associated with lower rates of pneumonia and delirium	35
	Increased time unit pressure, lower skill mix (less RNs)	Associated with higher rates of pressure injuries	36,37,38
<p>*Better nurse work environments according to the 'Practice Environment Scale' of the Nursing Work Index (PES-NWI) are those in which doctors and nurses have good working relationships, nurses are involved in hospital affairs, management listens and responds to patient care problems identified by bedside nurses, and institutions invest in the continued learning of nurses and quality improvement for patient care. (A number of revisions of the NWI have developed over time).</p> <p># "Magnet" hospitals is a status awarded to hospitals that satisfy a set of criteria designed to measure the strength and quality of their nursing. Process characteristics of the work environment are determined by the 'Essentials of Magnetism': (i) clinically competent peers, (ii) collaborative nurse–physician relationships, (iii) clinical autonomy, (iv) support for education, (v) adequacy of staffing, (vi) nurse manager support, (vii) control of nursing practice and (viii) patient-centered cultural values.</p> <p>^ NICHE (Nurses Improving Care for Healthsystem Elders) is a membership organisation. Is a nurse driven program designed to help hospitals and healthcare organizations improve the care of older adults, and depends on nurses at all levels to participate in a comprehensive infrastructure that promotes “gerontologizing” of the hospital culture.</p> <p>^^ HELP (Hospital Elder Life Program) which focuses on keeping hospitalized older people oriented to their surroundings, meeting their needs for nutrition, fluids, and sleep and keeping them mobile within the limitations of their physical condition. Has been applied within Geriatric Monitoring Units (GMU) also.</p> <p>~ 'Acute care of elders' (ACE) unit geriatric unit care characterized by one or more ACE components: patient-centered care, frequent medical review, early rehabilitation, early discharge planning, prepared environment.</p>			
<p>Table 6 References: 1. Ball 2014, 2. Jones 2015, 3. Kalisch 2012, 4. Rochefort 2010, 5. Schubert 2013, 6. Schubert 2007, 7. Papastavrou 2014, 8. Al-Kandari 2009, 9. Gravlin 2010, 10. Kalisch 2010, 11. Kalisch 2012, 12. Kalisch 2011, 13. Ausserhofer 2014, 14. Schubert 2008, 15. McHugh 2014, 16. Nantsupawat 2011, 17. Kelly 2012, 18. Stalpers 2015, 19. Van Bogaert 2009, 20. Zander 2014, 21. Cho 2015, 22. Kutney-Lee 2015, 23. Fox 2012, 24. Boltz et al., 2008, 25. Mudge 2013, 26. Inouye 2006, 27. Zaubler 2013, 28. Chong 2014, 29. Aiken 2012, 30. Cimiotti 2012, 31. Needleman 2001, 32. Kane 2007, 33. Kovner 2002, 34. Pappas 2008, 35. Twigg 2010, 36. Hickey 2004, 37. Horn 2005, 38. Pekkarinen 2008.</p>			

Kind of ethics	Ethical prioritisation philosophy	Description	Reference
Universal ethics (may not aid clinical decision making)	Utilitarianism	Greatest good for the greatest number (the ends justifies the means)	1
	Principle of equal chances	First come, first served	2
	Equity	More needs (more vulnerable) deserve more care	1
	Equality	Everybody deserves the same opportunities	3
	Beneficence	Above all, do good	2, 3
	Non-Maleficence	Above all, do no harm	3
	Patient autonomy	Patient has the right to choose or refuse treatment	3
Ethical frameworks that promote individuality of the patient	Holistic care	Care for the whole patient, in relation to their interpretation of their health	4
	Ethics of care	Each patient has a value, relationships between persons are treasured, there is always a web of relationships and responsibilities	4, 5
	Ethical particularism	Responding to the particular individual in the particular situation	
	Slow ethics	Focus on quality and heterogeneity of healthcare interactions, values time, space, care and attention, accepts complexity and uncertainty	6
Ethical frameworks that recognise that prioritisation occurs	Emergency Triage	Priority dependent on the immediacy of threat to life	4, 7
	Mass Casualty Triage	Prioritise salvageable patients	1
	Rule of rescue	Powerful psychological impulse to save those facing death	8
	Prestige	Prestige is given to action-oriented approach based upon the most pressing needs for medical treatment	9
	Prioritarianism	Give all individuals equal opportunity to live a normal life	8
	Justice	Considers distribution of scarce health resources	3
	Mature care	Balance between care for others and self-care. Recognises asymmetry in caring relationships and presence of competing needs	10
References: 1. Aacharyya 2011. 2. Pedersen 2008. 3. Page 2012. 4. Skirbekk 2014. 5. Gallagher 2013. 6. Nortvedt 2014. 7. Ritchie 2014. 8. Papastavrou 2014. 9. Album and Westin 2008. 10. Hem 2014.			