Development of Residential Aged Care Quality Indicators

Consultation paper

18 November 2019

pwc

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PricewaterhouseCoopers Australia (**PwC**) prepared this publication under a contract dated 19 September 2019 with the Commonwealth of Australia as represented by the Department of Health for the use and benefit of the Department of Health. The publication was prepared for the purpose of forming the basis of consultation with the aged care sector and expert committee on potential quality indicator measures.

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Glossary

Term	Description
Care recipient	An individual residing in a residential aged care home
The Department	The Australian Government Department of Health
InterRai	Refers to the InterRai consortium set up to promote evidence-informed clinical practice and policy decision-making through collection and interpretation of data
Resident	An individual residing in a residential aged care home
QI Program	Refers to the National Aged Care Mandatory Quality Indicator Program
QI Program (Victoria)	Refers to the Victorian PSRACS system
PSRACS	Public Sector Residential Aged Care Services in Victoria

Consultation overview

Background and context

The National Aged Care Quality Indicator Program (QI Program) became mandatory from 1 July 2019 for all Commonwealth subsidised residential aged care services. The new requirements are contained in the Aged Care Legislation Amendment (Quality Indicator Program) Principles 2019.

The objectives of the QI Program are:

- for providers to have robust, valid data to measure and monitor their performance and support continuous quality improvement; and
- over time, to give consumers transparent, comparable information about quality in aged care to aid decision making.

The three existing quality indicators (QIs) are pressure injuries, use of physical restraint and unplanned weight loss.

The Australian Government Department of Health (the Department) has engaged a Consortia consisting of PricewaterhouseCoopers (PwC) and the Centre for Health Services Research Centre at the University of Queensland, with the ongoing assistance of Dr Paresh Dawda as a representative of the Royal Australian College of General Practitioners (RACGP) to provide subject matter expertise, to review the existing QIs and to assist the Department in developing two new QIs - one for falls and fractures and one for medication management.

An evidence review has been completed by the Consortia to assess potential QIs for inclusion in the QI Program. Proposed QIs, and overview of the supporting evidence base and implementation considerations are presented in this consultation paper.

Purpose of consultation

We are seeking feedback on the proposed existing and new QIs. Feedback from consultations will inform and guide which QIs are to be selected for a trial (pilot) of new and existing indicators for the QI Program. This consultation paper has been developed to seek feedback and views from the aged care sector on the five QI domains:

Domain 1: Pressure injuries

Domain 2: Use of physical restraint

Domain 3: Unplanned weight loss

Domain 4: Falls and fractures

Domain 5: Medication management

Questions have been included in each section of this consultation paper as a guide and are not intended to be prescriptive or to limit feedback. In general, the type of feedback being sought includes, but is not limited to:

- Which indicator/s in each domain best meet the QI Program's key objectives?
- What are the strengths and limitations of each of the potential QIs?
- What, if any, modifications would be required for the QIs outlined to better meet the QI program's key purpose and objectives?

This consultation paper will be used as a basis for national face-to-face consultations from 20 November 2019 – 4 December 2019, and online written consultations, which may be accessed

via this link: https://vibesurveys.com/en/surveys/development-of-aged-care-quality-indicators-open-written-sector-consultation-pcg67netqfc/start.

Structure of consultation paper

This consultation paper presents context for discussion in three sections as follows:

- **Section One**: Proposed list of QIs for each domain
- **Section Two**: Program considerations
- **Appendices: A)** Detailed Tier 1 and Tier 2 QI tables from evidence review
  B) Additional Tier 3 quality measures from evidence review.

Section One: Proposed list of QIs for each domain

Summary of proposed QIs

QIs were identified through an evidence review of published and grey literature to assess the body of evidence relating to the following five QI domains. A list of 58 potential QIs (36 Tier 1 and 22 Tier 2) have been proposed for consultation in this paper across the following five domains:

QI domain 1: Pressure injuries (existing QI)

QI domain 2: Use of physical restraint (existing QI)

QI domain 3: Unplanned weight loss (existing QI)

QI domain 4: Falls and fractures (new QI)

QI domain 5: Medication management (new QI)

As an enabling tool for continuous quality improvement, QI programs should ideally include a combination of structural, process, and outcomes indicators. *"Structure is defined by the attributes of the settings in which care is provided, process by the activities of the care-giving practitioners, and outcome by the change in the health status of the patient*".[1] Quality of care can be measured by a combination of these indicators.

Process indicators collect data such as "was a resident weighed regularly to monitor weight? (yes or no)" and outcome indicators collect data such as "for residents with weight loss, was weight loss significant and/or planned?".

The QIs included for this consultation are outcome and process indicators that have been assessed by content experts against a bespoke assessment criteria rubric. This process assessed the strength of evidence for use of each QI in relation to its definition and level of specification, scientific properties (e.g. validity and reliability), context of current use, evidence of impact on quality of care outcomes and feasibility of data collection. More information is available about the assessment rubric in the accompanying 'Development of Aged Care Quality Indicators: Technical Findings from Review of Evidence' document.

Based on this assessment, the QIs were categorised from strength to weakness using three tiers:

Tier 1: identifies QIs with robust evidence and considerations made in relation to their potential use for the QI Program.

Tier 2: identifies QIs with some strong attributes or evidence of use in the sector, but where some limitations existed to fully assess the QI.

Tier 3: includes QI measures that are not identified as having established scientific properties but are relevant quality measures that could be further considered to inform the QI Program.

Detailed findings and assessment tables for QIs categorised as Tier 1 and Tier 2 are provided in Appendix A. Detailed findings and assessment tables for QI measures categorised as Tier 3 are included in Appendix B.

[1] Lorini, C., Porchia, B.R., Pieralli, F. *et al.* Process, structural, and outcome quality indicators of nutritional care in nursing homes: a systematic review. *BMC Health Serv Res* 18**,** 43 (2018) doi:10.1186/s12913-018-2828-0.

QI domain: Pressure injuries

Definition of pressure injuries

A pressure injury is a localised injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure, shear, or a combination of these factors. Age-related changes to skin integrity, malnutrition, chronic disease, immobility, incontinence, impaired cognitive status and frailty are issues associated with advanced age and are all cited as risks factors that can contribute to the development of pressure injuries.

Why monitoring pressure injuries is important

Older people are more susceptible to pressure injuries. This continues to be a major and prevalent health concern. In Australia, the prevalence of pressure injuries ranges between eight percent and 42 percent.[2] Up to 70 percent of pressure injuries occur in people aged over 70 years.[3]

Existing pressure injury QI

The pressure injuries QI currently used in the QI Program is the number of each stage of pressure injuries at each residential aged care service quarterly, based on the National Pressure Ulcer Advisory Panel (NPUAP) classification system derived from the United States of America.

Feedback on existing QIs

1. What are the advantages and disadvantages of the current QI measures, considering current definition against the program objectives?
2. What are some implementation enablers and barriers?

Existing and alternative pressure injury QIs

Prior to the QI Program becoming mandatory, stages of the pressure injuries QI were assessed based on the Wounds Australia classification system, a classification system that is also used to assess the pressure injury QI in the state-based QI Program (Victoria).

The approach of defining and categorising the stages of the pressure injuries QI based on a six stage classification system is subject to reliability limitations. In particular, these limitations relate to stages that rely on more subjective assessment, such as stage one pressure injuries. There is no publicly available data in Australia about intra/inter observer reliability of the existing pressure injuries QI.

The main difference between the uses of the different formats for pressure injuries QIs is whether they include stage one in the measurement. In Australia, stage one pressure injuries are always considered when measuring incidence or prevalence, while internationally, only stage two and above pressure injuries are typically measured.

The pressure injuries QIs identified in the evidence review varied in relation to the following:

- The classification system used to assess and stage pressure injuries
- Frequency of measurement
- Focus of measurement (e.g. injury incidents or people).

[2] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41.

[3] Jaul E 2010, 'Assessment and management of pressure ulcers in the elderly: current strategies', Drugs & Aging, vol. 27, no. 4.

The following table summarises a list of alternative QIs and measures for consideration. Note that the existing program QIs have been highlighted in the table below and have been presented in the same table for ease of comparability. Detailed tables for Tier 1 and Tier 2 QIs are provided in Appendix A.

Table 2: Pressure injury QIs

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI1: Total pressure injuries at each stage for each service (NPUAP system)	QI Program - *mandatory*	- Existing QI for QI Program and Victoria. - Two classification schemes have been used (NPUAP and Wounds Australia). Revised QIs could consider which is best to apply moving forward. - May be reported as total, proportion or as prevalence rates. - Pressure injury QIs under the QI Program and QI Program (Victoria) are interpreted as being identical to one another.
Tier 1	QI2/QI3: Total pressure injuries at each stage for each service (WAL system)	QI Program – *voluntary* QI Program (Victoria)	
Tier 1	QI4: Presence of a pressure injury (including levels 1-4)	Research Study (Victorian Data)	
Tier 1	QI5: Total pressure injuries (Stage 2 or above) per care recipient at point in time	International (South Korea)	- NPUAP classification scheme used. - Example of reporting a smaller subset of stages. - Reports less subjective stages to measure.
Tier 1	QI6: Total high-risk care recipients with Stage II-IV or unstageable pressure injuries	International (USA)	- Part of USA MDS (Minimum Data Set) system and demonstrates high adoption internationally. - MDS also applies NPUAP staging classification with supporting risk screening tools such as Braden Scale for Predicting Pressure Sore Risk. - MDS is well validated and has benchmarking benefits.
Tier 1	QI7: Care recipients with timely re-assessments for the risk of developing pressure injuries (after surgical or interventional procedure or change in their care environment following a transfer)	International (UK)	- Considerations for how this indicator could be implemented are outlined in guidance documents and include changes in clinical status, and pressure ulcer risk status.
Tier 1	QI8: Care recipients who developed a Stage II to IV pressure ulcer since last assessment	International (Canada)	- Part of MDS system and demonstrates high adoption internationally. - MDS also applies NPUAP staging classification with supporting risk screening tools such as Braden Scale for Predicting Pressure Sore Risk. - MDS is well validated and has benchmarking benefits.
Tier 1	QI9: Care recipients whose Stage II to IV pressure ulcer worsened		
Tier 1	QI10: Incidence of pressure injuries	Research Study (Australia)	- QI10 and QI11 were assessed as having the same proposed wording as each other. One is reported as an incidence and one is reported as an incidence rate. - Measuring incidence or incidence rates may be and alternative option to percentage or prevalence.
Tier 1	QI11: Incidence rate of pressure injuries	Longitudinal Study (Australia)	

Tier	Proposed QI	Currently used	Considerations
			- Benefits of measuring incidence as a quality indicator is that it identifies new injuries, not existing. - There is also a dependency on regular assessment and recording of new or deteriorating injury that may be more difficult to achieve.
Tier 2	QI12: Pressure Ulcer and Fall Rate Composite Index = 100 – PUR – FR	Not currently in use	- Benefits of composite measures include ability to compare relationships between two QIs and for benchmarking purposes. - Emerging in evidence and use. - This index may be difficult to interpret and requires guidance.

Feedback on alternative QIs

3. What are the possible advantages and disadvantages of the proposed QIs, specifically in relation to the QI Program objectives?
4. Which classification system should be considered for the pressure injuries QI (NPUAP, Wounds Australia or a simpler model)?
5. Should all or a subset of the six (NPUAP or Wounds Australia classification system) pressure injury stages be collected under the QI Program?
6. How often should pressure injuries be assessed each quarter?
7. Is it more meaningful to report the number of pressure injuries at a service, or care recipients with a pressure injury/injuries?
8. Any other comments or feedback on the existing or potential QI measures?

QI domain: Use of physical restraint

Definition of physical restraint

Restraint means any practice, device or action that interferes with a care recipient's ability to make a decision or restricts a care recipient's free movement. For the purpose of the QI Program physical restraint means any restraint other than a chemical restraint, or the use of medication prescribed for the treatment of, or to enable treatment of a diagnosed mental disorder, a physical illness or a physical condition. Examples of physical restraint are available in the National Aged Care Mandatory Quality Indicator Program Manual 1.0. Physical restraint can be applied through devices, equipment, furniture, secured spaces or actions to limit the movement of a care recipient.

Why monitoring physical restraint is important

Physical restraint can cause negative outcomes. The incidence of physical restraint in residential care services across Australia is poorly documented. However, the available evidence suggests an incidence of 15 to 30 percent.[4] Evidence suggests the prevalence of physical restraint use in residential care services is between 12 and 49 percent.[5]

There is a strong body of evidence of effective strategies and non-pharmacological interventions that greatly reduce the need for restraints by managing the underlying causes of the behaviour through environmental and psychosocial care approaches.

Existing physical restraint QI

The QI Program currently collects data relating to two categories of restrictive practices: intent to restrain and the number of physical devices used. The National and Victorian programs collect the same physical restraint QIs, which are reported as a prevalence rate per 1000 occupied bed days. The prevalence rates are based on the aggregated service-level scores of three observation assessments on each of the three assessment days for the quarter. Existing program QIs are highlighted in Table 3.

Feedback on existing QIs

1. What are the advantages and disadvantages of the current QI measures, considering current definition against the program objectives?
2. What are some implementation enablers and barriers?

Existing and alternative physical restraint QIs

Most physical restraint QI definitions are clearly stated and the calculation process well-defined in the literature. Most of the evidence relates to application in the USA using the MDS.[6] Derived physical restraint QIs, which is formally endorsed as part of the USA federal mandatory process. These have been proven to be a valid and reliable tool in QI measurements in the USA intended for use in residential aged care services.

The existing QI Program physical restraint QI mirrors that of the Victorian QI scheme in defining a count of the intent to restrain. No evidence was found in the contemporary literature reviewed or international QI Programs to support the merit of a count, or the concept of 'intent' to physically restrain.

Additionally, the existing physical restraint QI includes a measure relating to the number of physical restraint devices used. There was no evidence in the contemporary literature that identified other QIs that measure the count of devices used. Presumably this approach offers an attempt to quantify the use of restraints beyond a simple count of residents who are restrained. Consequently, there is no evidence to

[4] Johnson S, Ostaszkiewicz J and O'Connell B. Moving beyond resistance to restraint minimization: a case study to change management in aged care', Worldviews on Evidence-Based Nursing. 2019.

[5] Alzheimer's Australia. The use of restraints and psychotropic medications in people with dementia. 2014.

[6] Resident Assessment Instrument Minimum Data Set Version 2.0 (RAI-MDS 2.0) which is used as a comprehensive, standardised tool to assess residents in aged care settings in USA

support this concept reported in the contemporary literature that was reviewed, and evidence of reliability of observations when this approach is used was unable to be sourced.

The evidence review identified physical restraint QIs that relate to incidence or prevalence but primarily differ in relation to:

- The unit to count (e.g. restraint devices or restraint occurrences)
- The level of detail (inclusions/exclusions) of types of restraint
- The time period for measurement.

The following table summarises a list of alternative QIs and measures for consideration. Note that the existing program QIs have been highlighted in the table below and have been presented in the same table for ease of comparability. Detailed tables for Tier 1 and Tier 2 QIs are provided in Appendix A.

Table 3: Physical restraint QIs

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI1: Total care recipients physically restrained	Research Study (Australia)	- Same measurement concept as QIs 3 and 5, minus use of the term 'intent'.
Tier 1	QI2: Care recipients in daily physical restraint over the last 7 days	International (Canada)	- QIs 2, 7 and 8 measure similar things and have the same proposed wording. - Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology). - Alternative restraint definition referring to the type of restraint e.g. trunk restraint, limb restraint.
Tier 2	QI3/QI5: Use of physical restraint – intent to restrain	QI Program (Australia & Victoria)	- Existing QI for QI Program and QI Program (Victoria). - 'Intent' to physically restrain is not recognised in international QI Programs. - The need for continued use of the term 'intent' should be considered, in order to align the QI Program with the literature and international practice. - International use of similar QIs do not provide further indication of whether to include or exclude residents in secure areas.
Tier 2	QI4/QI6: Use of physical restraint devices	QI Program (Australia & Victoria)	- Existing QI for QI Program and QI Program (Victoria). - International use of similar QIs do not provide further indication of whether to include or exclude residents in secure areas.
Tier 2	QI7/QI8: Percentage of care recipients restrained	International (USA)	- QIs 2, 7 and 8 measure similar things and have the same proposed wording. QI7 (from source) measures "percentage of patients with physical restraint use" and QI8 (from source) measures "percentage of patients in a physical restraint device". - Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology). - Alternative restraint definition referring to the type of restraint e.g. trunk restraint, limb restraint.

Feedback on alternative QIs

3. What are the possible advantages and disadvantages of the proposed QIs, specifically in relation to the QI Program objectives?
4. Consider which QI provides a more meaningful measure: proportion/number of people restrained, devices, intents or a combination of these?
5. What are your views on if and how secure areas might be reported as part of a QI?
6. How often should the use of physical restraint be assessed each quarter?
7. Any other comments or feedback on either the existing or identified QI measures?

QI domain: Unplanned weight loss

Definition of unplanned weight loss

Unplanned weight loss is a result of deficiency in a person's intake of energy (calories), which may be both a symptom and consequence of disease. For the purposes of the QI Program, unplanned weight loss is where there is no written strategy and ongoing record relating to planned weight loss for the care recipient.

Why monitoring unplanned weight loss is important

The prevalence of unplanned weight loss in residential aged care recipients in Australia is reported to vary between 13 to 31 percent depending on the study used.[7] Two key Australian studies have concurred that the prevalence of malnutrition in residential aged care is approximately 50 percent.[8] In addition to this, those most at risk are care recipients over the age of 90 and/or those with increased care needs.

Existing unplanned weight loss QI

The QI Program currently collects data relating to two categories of unplanned weight loss: significant unplanned weight loss and consecutive unplanned weight loss. Existing program QIs are highlighted in Table 4.

Feedback on existing QIs

1. What are the advantages and disadvantages of the current QI measures, considering current definition against the program objectives?
2. What are some implementation enablers and barriers?

Existing and alternative unplanned weight loss QIs

QIs identified for weight loss are predominantly conceptualised as the prevalence of unplanned weight loss in care recipients, defined for most QIs across a specified timeframe. However, the amount of unplanned weight loss (e.g. 2kg or 5%) and timeframe the QI is reported (e.g. 1 month or 1 year) varies between QIs.

The majority of the weight loss QIs identified have well-defined criteria including some that are widely used internationally. For example, in the USA, weight loss is a key indicator of care provision in the long-term care setting and is required to be collected routinely.

Potential QIs relating to malnutrition were also identified in the contemporary literature. Malnutrition has been found to occur among older people and is defined as a lack of uptake or intake of nutrition leading to decreased fat free mass and body cell mass, leading to diminished physical and mental function and impaired outcome from disease. Diagnosis of malnutrition requires assessment by a dietitian consequently, malnutrition QIs relate to either the screening for, or identification of malnutrition risk.

The evidence review identified unplanned weight loss QIs that vary in relation to:

- The amount of weight loss defined (e.g. ≥3 kgs, ≥4percent or ≥5percent)
- The timeframes of the weight loss measured (e.g. within one month, three months, since previous assessment, in previous year)

[7] RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

[8] Gaskill D, Black L et al. Malnutrition prevalence and nutrition issues in residential aged care facilities. Australasian Journal on Ageing, 27. 2008; Banks M, Ash S, Hauer J et al. Prevalence of malnutrition in Queensland public hospitals and residential aged care facilities. Nutrition and Dietetics, 64. 2007.

- The level of specificity of measurement (e.g. time of day, method of weighing etc.)
- Exclusionary criteria (to exclude people with predictable weight loss associated with specific conditions).

The following table summarises a list of alternative QIs and measures for consideration. Note that the existing program QIs have been highlighted in the table below and have been presented in the same table for ease of comparability. Detailed tables for Tier 1 and Tier 2 QIs are provided in Appendix A.

Table 4: Unplanned weight loss QIs

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI1/QI2: The total number of care recipients who experienced significant unplanned weight loss for the quarter	QI Program (Australia & Victoria)	- Existing QI for QI Program and QI Program (Victoria). - Definition of 'significant weight loss' is currently defined as equal to/or greater than three kilograms. Evidence indicates significant variation in the amount of weight loss measured and the time period of measurement. - Research has identified that weight loss over time can predict malnutrition. - The International Classification of Disease definition of malnutrition has been Australian Modified (ICD-10AM) and is used across health sectors to define malnutrition. This has been interpreted into BMI and percentage weight loss. Consequently, there is an opportunity to align QI measures with the ICD 10-AM criteria used in other health sectors and internationally.
Tier 1	QI3: Care recipients who lose too much weight - 5% or more in one month and 10% or more in 6 months	International (USA)	- Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology).
Tier 1	QI4: Unplanned weight loss of 2kg or more in a month	Research Study (Australia)	- Evidence for the use of different weight loss threshold and timeframe through similar international QIs (see QIs 7, 8, 13 and 16 below).
Tier 1	QI5: Proportion of care residents without unexplained weight loss since previous assessment	Not currently in use	- Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology).
Tier 1	QI6: Inadequate Meals - Care recipients who ate less than 1 meal in two of the last three days	International (USA)	- Derived from the InterRAI system, part of which is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology).
Tier 1	QI7: Unplanned weight loss of more than 5 % over 30 days	International (Finland)	- Evidence for the use of different threshold and timeframe (see QIs 4, 8, 13 and 16). - Finland has two measures: > 5% over 30 days; >10% over 180 days. - MUST tool demonstrated good reliability between health care workers.
Tier 1	QI8: Unplanned weight loss of more than 10 % over 180 days	International (Finland)	- Evidence for the use of different threshold and timeframe (see QIs 4, 7, 13 and 16). - Finland has two measures: > 5% over 30 days; >10% over 180 days. - MUST tool demonstrated good reliability between health care workers.

Tier	Proposed QI	Currently used	Considerations
Tier 2	QI9/Q10: The total number of care recipients who experienced consecutive unplanned weight loss in the quarter	QI Program (Australia & Victoria)	- Existing QI for QI Program and QI Program (Victoria). - Definition of 'significant weight loss' is currently defined as equal to/or greater than three kilograms. Evidence indicates significant variation in the amount of weight loss measured and the time period of measurement. - Research has identified that weight loss over time can predict malnutrition. - The International Classification of Disease definition of malnutrition has been Australian Modified (ICD-10AM) and is used across health sectors to define malnutrition. This has been interpreted into BMI and percentage weight loss. Consequently, there is an opportunity to align QI measures with the ICD 10-AM criteria used in other health sectors and internationally.
Tier 2	QI11: Percentage of care recipients screened for malnutrition risk	International (UK)	- Malnutrition Universal Screening Tool (MUST) used to assess malnutrition risk. - NICE includes another QI which includes "Residents screened for malnutrition risk monthly".
Tier 2	QI12: Care recipients screened monthly for malnutrition risk		
Tier 2	QI13: Prevalence of weight loss ≥4 percent in the previous year	International (Sweden)	- Evidence for the use of different threshold and timeframe (see QIs 4, 7, 8 and 16).
Tier 2	QI14: Timely Nutritional Risk Assessment has been performed for the care recipient	International (UK)	- Multiple malnutrition screening tools available to assess risk. These include the Short Nutritional Assessment Questionnaire for Residential Care (SNAQ-RC), the preferred tool by way of validity, Mini Nutritional Assessment – Short Form (MNA-SF) and the Malnutrition Universal Screening Tool (MUST). A QLD Health comparison project identified that all tools perform 'fair' to 'poorly' when applied in residential aged care settings.
Tier 2	QI15: Total care recipients with nutrition enquiry completed	International (Netherlands)	- Could potentially be renamed as 'Percentage of residents with nutritional assessment within 3 days of admission' or into an ongoing nutritional assessment process indicator.
Tier 2	QI16: Care recipients with unplanned weight loss	International (Portugal)	- Evidence for the use of different threshold and timeframe (see QIs: 6, 7, 8 and 13). - Portugal applies similar concepts in home care and hospital settings.

Feedback on existing QIs

3. What are the possible advantages and disadvantages of the proposed QIs, specifically in relation to the QI Program objectives?
4. Could a focus on kilograms, percentage weight loss, Body Mass Index or malnutrition risk be more useful?
5. What threshold of unplanned weight loss do you prefer and why?
6. Any other comments or feedback on either the existing or identified QI measures?

QI domain: Falls and fractures

Definition of falls and fractures

A fall is an event that results in a person coming to rest inadvertently on the ground or floor or other lower level. Of the care recipients who do fall each year, approximately 20–32 percent will experience a fall-related fracture.[9] Falls from a standing height in a person with normal bone density should not generally cause a fracture, however these rates are correlated with higher incidence of osteoporosis and osteopenia in this care recipient cohort. [10]

Why monitoring falls and fractures is important

Falls and their associated fractures are ideal markers for the examination and understanding of the level of care offered to older people.[11] Falls are currently the leading cause of unintentional injury of older Australians and occur in approximately half of older people living in residential care every year.[12] Unfortunately, these falls are often unwitnessed and certainly underreported and it is likely that the incidence is higher.

There is evidence that 40 percent of the residents who fall in the aged care setting will experience recurrent falls.[13] The age-standardised rate of fall-related injury cases occurring in residential aged care is six times as high as the rate of falls in the community. There are many adverse physical consequences to falls including major and minor injury, subsequent decreased function and occasionally death. However, what is also important to understand is the psychological impact of falls and the fear of falling. The fear of falling, in itself, often negates more falls as a loss in confidence can mean a decrease in activity, thus increasing frailty.[14] People aged 80 years or more are at the highest risk of falls and fractures. This age group represents the highest proportion of residents in aged care. Of fall-related deaths, 84.8 percent are in people aged 70 years and older.[15]

While not all falls (with and without injury) can be prevented, the evidence suggests that falls rates can be reduced. Dignity of risk should also be promoted consistently with consumer choice and control. It is considered critical to routinely screen for falls risk and to have QI monitoring of the results of interventions or programs in place for minimising falls. Such QIs for falls are already made mandatory in the minimum data set for residential assessment instruments in many countries including the United States of America, Canada and the United Kingdom.

Suggested falls and fractures

Falls and fractures are generally defined in the same way through international literature on QIs in both the aged care and hospital/health care settings. The QIs tend to vary on:

- Breadth of concept - falls only, injury only or falls and injury
- Frequency of data collection
- Reporting format as percentages or prevalence rates (per 1000 occupied bed days)

[9] National Institute for Health and Care Excellence. NICE impacts falls and fragility fractures. United Kingdom; 2018.

[10] National Institute for Health and Care Excellence. NICE impacts falls and fragility fractures. United Kingdom; 2018.

[11] National Institute for Health and Care Excellence. NICE impacts falls and fragility fractures. United Kingdom; 2018.

[12] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[13] Synergia. Reducing Harm from Falls Programme Evaluation: A report for the Health Quality & Safety Commission. New Zealand. 2016.

[14] Synergia. Reducing Harm from Falls Programme Evaluation: A report for the Health Quality & Safety Commission. New Zealand. 2016.

[15] Johannson E, Jonsson H, Dahlberg R. The efficacy of multifactorial falls-prevention programme, implemented in primary health care. British Journal of Occupational Therapy; 2018.

- Injury type (e.g. fractures, head injuries)
- Injury severity (e.g. major injuries (including fractures) or minor injuries).

The following table summarises a list of QIs and measures for consideration. Detailed tables for Tier 1 and Tier 2 QIs are provided in Appendix A.

Table 5: Falls and fractures QIs

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI1: Total falls at a service	QI program (Victoria); International (NZ)	- This QI is used by the Victorian PSRACS system. - QI measures total falls and not number of residents who fall, meaning one resident could contribute a disproportionately high count to the overall number.
Tier 1	QI2: Total fall-related fractures	QI program (Victoria)	- This QI is in current use in the Victorian PSRACS system.
Tier 1	QI3: Care recipients who had falls	International (Canada)	- This QI measures the number of people who fell rather than the number of falls per service. - This QI will not differentiate between a care recipient falling once or on 10 occasions in the quarter.
Tier 1	QI4: Care recipients who fell in the last 30 days	International (Canada)	- Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology). - This QI measures the number of people who fell rather than the number of falls per service. - This QI will not differentiate between a care recipient falling once or on 10 occasions in the quarter. - Evidence for measuring falls over a different timeframe.
Tier 1	QI5: Care recipients experiencing one or more falls with major injury	International (USA)	- Part of MDS system is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology). - Many QIs restrict only to fractures as the resulting injury, which then under-report falls that cause other serious injuries.
Tier 1	QI6: Percentage of care recipients with a continence or toileting care plan	International (UK)	- The National Health Service Falls and Fragility Fracture Audit Programme (FFAP), a national clinical audit programme, provides additional process and structural evidence for consideration in this context. - Seven indicators included as part of this audit are process indicators and are described in the report.
Tier 1	QI7: Percentage of care recipients with a recent measurement of their lying and standing blood pressure		
Tier 1	QI8: Percentage of care recipients with a recent assessment for medication that increases falls risk		

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI9: Percentage of care recipients with a recent vision assessment		
Tier 1	QI10: Percentage of care recipients with a call bell within sight and reach of the care recipient when they are alone		
Tier 1	QI11: Percentage of care recipients with an appropriate mobility aid in reach of care recipient		
Tier 1	QI12: Percentage of care recipients that received a specialist falls assessment		
Tier 2	QI13: The Pressure Ulcer and Fall Rate Quality Composite Index = 100 - PUR -FR	Not currently in use	- Benefits of composite measures include ability to compare relationships between two QIs and for benchmarking purposes. There is some emerging evidence for use in Australia.
Tier 2	QI14: Percentage of care recipients assessed for the presence or absence of delirium	International (UK)	- The National Health Service Falls and Fragility Fracture Audit Programme (FFAP), a national clinical audit programme, provides additional process and structural evidence for consideration in this context. - Seven indicators included as part of this audit are process indicators and are described in the report.
Tier 2	QI15: Percentage of care recipients as at risk of falling who received individualised care plans that addressed risks	International (NZ)	- Currently collected as part of NZ's Health Safety and Quality Commission Standards. - Used interchangeably with contextual process indicators in the hospital/acute care setting and services.
Tier 2	QI16: Number and rate of acute falls, by place of occurrence	International (NZ)	- Currently collected as part of NZ's Health Safety and Quality Commission Standards. - Used interchangeably with contextual process indicators in the hospital/acute care setting and services.

Feedback on proposed QIs

1. What are the possible advantages and disadvantages of the proposed QIs, specifically in relation to the QI Program objectives?
2. Which is a more meaningful indicator – measuring total number of falls or people who fall?
3. Should major injuries (beyond fracture) be captured under falls and fractures QIs?
4. Should additional process measures (identified in the Tier 2 measures from the UK) be considered for collection and should these be optional or mandatory?
5. Any other comments or feedback on either the existing or identified QI measures?

QI domain: Medication management

Definition of medication management

Medication management plays a critical role in achieving quality of care for older people in aged care and hospital settings. medication management is a key focus for quality and safety initiatives in Australia and internationally across aged care, hospital and community health services.

Why monitoring medication management is important

The high prevalence of comorbid conditions in residents of residential age care services often leads to prescription of multiple medications. Polypharmacy is common in this population (prevalence of up to 91 percent depending on the definition) and has been associated with harms such as adverse drug events, cognitive decline and hospitalisation.[16] Residents of residential aged care services are also commonly exposed to potentially inappropriate medications and this has been shown to be associated with poor health outcomes. The common use of certain medication classes, such as antipsychotics, is also of concern in this population.

Suggested medication management QIs

The evidence review of QIs associated with medication management yielded a range of QIs relating to four key categories:

- Inappropriate use of particular types of medication to restraint behaviour (commonly referred to in the Australian aged care context as ‘chemical restraint’)
- Polypharmacy
- Medication errors
- Other medication-related QIs.

The following table summarises a list of QIs and measures for consideration. Detailed tables for Tier 1 and Tier 2 QIs are provided in Appendix A.

Table 6: Medication management QIs

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI1: Care recipients receiving nine or more medications	QI program (Victoria)	- Evidence based guidance around polypharmacy suggests that the risk of adverse events increases with increasing medication load - there is minimal evidence around optimal frequency of review. - Consideration will need to be given around which medications are captured i.e. skin creams, inhalers versus classes of medications.
Tier 1	QI2: Care recipients who received antipsychotic medication	International (Canada)	- This QI currently measures across the total population. Consideration will need to be given to whether this indicator could measure two things: whether a care recipient receives antipsychotic medication and whether there was a diagnosis for psychosis (see QI5).
Tier 1	QI3: Care recipients who received anti-anxiety or hypnotic medication	International (USA)	- Consideration will need to be given around measurement of this in the Australian context.

[16] Jokanovic N, Tan EC, Dooley MJ, Kirkpatrick CM, Bell JS. Prevalence and factors associated with polypharmacy in long term care facilities: a systematic review. Journal of the American Medical Directors Association, 2015;16(6):535-e1.

Tier	Proposed QI	Currently used	Considerations
Tier 1	QI4: Medication errors resulting in an adverse event requiring intervention	Australia (Healthcare organisations)	- Reliability and validity of this QI for use in the Australian residential aged care context will need to be tested as part of the field testing (the next stage of this QI development process). - Guidance for interpreting and data collection for this QI could be adapted from existing materials associated with this QI for the hospital context.
Tier 1	QI5: Care recipients on antipsychotics without a diagnosis of psychosis	Not currently in use	- Derived from the InterRAI system, part of which is validated, adopted internationally and has benchmarking benefits (these include established benchmarks supported by methodology). - This QI measures whether a care recipient receives antipsychotic medication and whether there was a diagnosis for psychosis (see QI2).
Tier 2	QI6: Care recipients using regular antipsychotic medicines	Not currently in use (pilot testing in Victoria program)	- This QI is best used as a secondary QI to provide more context to a primary QI that measures polypharmacy. - Another secondary QI could include measuring date of last medication review.
Tier 2	QI7: Care recipients using regular proton pump inhibitors	Not currently in use (pilot testing in Victoria program)	- The QI program (Victoria) has recently developed, and pilot tested this indicator in the PSRACS system. - Similar indicators (proton pump inhibitor specifically) were not found in the rapid, targeted review of evidence of QIs although this was not exhaustive.
Tier 2	QI8: Total number of medication errors by service	Not currently in use	- Whilst these are process measures, they can be useful ways to measure and prevent risk.
Tier 2	QI9: Care recipients with more than 4 regular medication administration times	Not currently in use (pilot testing in Victoria program)	- The QI program (Victoria) has recently developed, and pilot tested this indicator in the PSRACS system. Similar indicators (frequency of medication administration) were not found in the rapid, targeted review of evidence. - Proposed QIs are best used in combination with a QI measuring polypharmacy for additional context. In addition to measuring polypharmacy, this measure may be useful since there is emerging evidence that complex medication regimens adversely impact on resident's quality of life.
Tier 2	QI10: Percentage of care recipients on polypharmacy (10 or more)	Not currently in use	- Similar QI concept to QI1 with variation in polypharmacy definition: 9 vs. 10.
Tier 2	QI11: Multiple quality indicators mentioned i.e. Medication appropriateness in the most prevalent diseases and General medication appropriateness	Not currently in use	- Findings from this study highlighted that medication reviews and comprehensive geriatrician reviews can improve medication-related quality of care in aged care. - Overuse of high-risk medications was associated with falls and medication quality of care in aged care activities could be better targeted towards monitoring and reducing exposure to benzodiazepines and antipsychotics. - Consultations for QIs could consider supplementary monitoring of prescribing and/or utilisation rates for these medications to provide contextual information

Tier	Proposed QI	Currently used	Considerations
			in a similar vein to QIs 6, 7 and 9 that extends beyond a focus on polypharmacy alone.
Tier 2	QI12: No pharmacy review of medication	QLD (CCI)	- Part of the Queensland Clinical Care Indicator Tool. - Defined as absence of a pharmacy (medication) review, the QI looks at number of residents whose medications have not been reviewed within the last 180 days.

Feedback on proposed QIs

1. Which of the four key medication management QI categories ('chemical restraint', polypharmacy, medication errors or other medication related QIs) could best support the QI program objectives?
2. What are the possible advantages and disadvantages of the proposed QIs?
3. What are the perceived implementation enablers and barriers of this preferred medication management QI?
4. Any other comments or feedback on either the existing or identified QI measures?

Section Two: Program considerations

Optimal attainment of the QI program objectives, which pertain to quality improvement and provision of quality information about aged care services, is dependent upon the effective implementation of the new and reviewed QIs. Along with informing and identifying which QIs will be selected for pilot, this consultation seeks feedback on enablers and barriers to implementation. A selection of implementation considerations, consolidated from previous reviews, is described below to provide some context.

1. Building an understanding of the QIs and the Program

Building an understanding of the purpose and nature of each QI is an important enabler to creating engagement in the program and enhancing perceived value and application of QIs. For example, some QIs may be better used to assess and identify risk, while others may be more useful for making comparisons between residential aged care services. Clear and accessible guidance and support materials, which include clear definitions, education and training materials, quick reference tools, templates, easy-to-use data collection and reporting mechanisms have been previously identified to be important enablers to supporting effective QI program implementation.

A number of QI programs in Australia and internationally that are focused on monitoring and responding to QIs for quality and continuous improvement, provide a system of support, education and guidance to facilities as part of the program. Examples of this include the QI Program (Victoria) and the MDS in the USA. In these examples, facilities that adopted QI programs, invested in building capacity to interpret reports to understand performance implications and identify improvement opportunities

2. Data collection and reporting

Consistency in when and how frequently data is collected enables accuracy and comparability within and between services and residents. Good quality data is an important driver of continuous improvement, enabling public reporting and benchmarking so that services may make comparisons to assess and improve quality. Public reporting can also provide transparency and choice to residents and families.

Risk adjustment and/or stratification

Risk adjustment and/or stratification needs to be incorporated to account for factors relating to client complexity when comparing performance between and within facilities over time. Risk adjustment is most commonly completed on a clinical basis for comorbidity or illness severity. Statistical methods of risk adjustment can equalise differences in risk across providers.

Risk stratification can also be completed concurrently to generate a view of inequity related to factors like income, education and literacy. This approach helps to unmask differences in QI and facility performance for disadvantaged populations. Using dementia as an example, risk stratification can be performed on facility characteristics such as facilities with a high proportion of residents that specialise in dementia care.

It is anticipated that, once the QI data has been established as valid and reliable, risk adjustment may be considered.

There are a number of factors that impact what QIs measure. These include the validity and sensitivity of each QI i.e. how QIs are measured and how findings are reported.

Measurement factors

Validity issues can arise when there is more than one quality issue observed for a single person e.g. multiple pressure sores. The number of people observed or assessed for an issue can be influenced by differences in how assessment guidance is applied between assessors and how the QI is calculated. Guidance on how the existing QIs are analysed and presented is available in the National Aged Care Mandatory Quality Indicator Program Manual 1.0.

Sensitivity issues can arise when monitoring QIs for rare events. Incorporating QIs that measure rare events such as serious pressure injuries, which occur infrequently can be problematic for a large, mandated reporting program, despite the strength of the Indicator.

3. Workforce and staffing challenges

Many services experience ongoing workforce and staffing challenges that may include high turnover and retention issues. Effective communication and leadership, supported by education, awareness-raising and accessible support can help to support addressing some of these implementation challenges.

4. Capability and capacity

Growing workloads place additional pressure among services personnel. Previous reviews have indicated that whilst capacity and capability training are critical to supporting implementation, they should be implemented in a considered way. This includes minimising the burden of training related to QIs and the program, creating easy to read reference guides to support in the moment application and recognising the need for more/different staff and skills to support continuous improvement practices.

Additional feedback

1. What are views on the optimal and preferred frequency of data collection, noting that much of the evidence involves collecting prevalence data quarterly?
2. Which reporting method is most meaningful (prevalence, incidence, proportion, percentage, number of people etc.)?
3. Is reporting more meaningful when reported as total care recipients impacted or the total number of events?
4. What are views on the submission of comments in the My Aged Care Provider Portal as part of the QI data? Should QIs require accompanying comments? Is this a useful function to support continuous improvement? Would services prefer to provide only numerical data?
5. How would services integrate this data collection into usual business? What materials would be useful to assist you to collect and report the data?
6. Would it be helpful if the QIs had materials in the manual to support quality improvement e.g. assessment or quality improvement planning tools?
7. Any other comments or feedback on either the existing or identified QI measures?

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Appendix A: Detailed Tier 1 and Tier 2 tables (evidence review)

Table 7: Detailed tables from evidence review for pressure injuries Tier 1 and Tier 2 QIs

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 1	QI1: Total pressure injuries at each stage per care recipient	QI Program	1. The number of pressure injuries per stage as defined by The National Pressure Ulcer Advisory Panel (NPUAP). Six categories are measured and assessed: -Stage 1 pressure injuries: non-blanchable erythema of intact skin -Stage 2 pressure injuries: partial-thickness skin loss with exposed dermis -Stage 3 pressure injuries: full-thickness skin loss	Observation assessments of each care recipient each quarter.	Numerator: The total number of occurrences of pressure injuries assessed at each stage of the NPUAP at each service at which the approved provider provides residential care. Denominator: x1000 occupied bed days. *Occupied bed days (OBD) is the number of days in care in the subsidy claiming system* Exclusions: Nil.	QI1: Number of each stage of pressure injuries for each resident[17]	Indicators QI1 - QI4 focus on very similar measurement concepts and as such, the following considerations apply. Collection: Classifying pressure injuries is resource intensive to administer and requires a full body assessment. This is considered part of routine care. Collection requires standardisation. This is subject to reliability challenges. Limited evidence was found comparing NPUAP classification system scientific properties (reliability) to interRAI/MDS systems. Reliability of recording Stage 1 injuries may not be ideal and liable to false positive recordings. Assessment of Stage 2-4 injuries are more reliable. Two classification scheme options may be considered: a) Wounds Australia Classification[18] (prior the QI Program becoming mandatory, Services were reporting against these categories) b) NPUAP (Services have been reporting against this classification since the QI Program became mandatory) Reporting and calculation: Proportion (total number of residents) or prevalence rates (per 1000 occupied bed days). Services with higher turnover are likely to have systematically lower rates per 1,000 bed days. Rates are also impacted by the residents excluded from assessment due to criteria set out in the guidelines. While residents may be excluded from the numerator in the rate, they are not excluded from the denominator. Hence services with a higher number of residents excluded from assessment will have systematically lower rates for these QI. Continuous Improvement: The value to a quality improvement program of including counts of levels of pressure injuries that are rare may be questioned. There may be the potential to blend counts of stages together in
Tier 1	QI2: Total pressure injuries at each stage for each service	QI Program				QI2: Total number of occurrences of pressure injuries assessed at each stage of the NPUAP at each service at which the approved provider provides residential care[19]	

[17] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

[18] Australian Wound Management Association, Prevention and treatment of pressure ulcers: clinical practice guideline. 2014.

[19] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			-Stage 4 pressure injuries: full-thickness loss of skin and tissue -Unstageable pressure injuries: obscured full-thickness skin and tissue loss -Deep tissue injuries: persistent non-blanchable deep red, maroon or purple discoloration). 2. OR Wounds Australia classification: -Stage 1 pressure injuries: non-blanchable erythema -Stage 2 pressure injuries: partial-thickness skin loss -Stage 3 pressure injuries: full thickness skin loss -Stage 4 pressure injuries: full-thickness tissue loss -Unstageable pressure injuries: depth unknown -Deep-tissue injuries: depth unknown).				data collection or reporting. The value to a quality improvement program of including counts of stage 1 pressure injuries (with intact skin) is questionable. There were instances where QI reporting has been excluded from stage 1 to limit double counting: -Services have already begun to collect and record data against this indicator for the QI Program, so significant changes has implications for services who have already altered systems/processes to record against the indicator in its current form -Reliability of the recordings of pressure injury and grading has been tested for those derived from the interRAI/MDS systems. It could be assumed that prevalence recorded using the NPUAP classification would generate similar reliability, but formal testing evidence was not identified in the current literature review -The use of rates (per 1000 bed days) has the advantage of capturing incidence of pressure injury when compared to the basic count approach (number of injuries on a specific date) -Rates are usually impacted by the residents excluded from assessment due to criteria set out in the guideline - in this case no exclusions apply - In comparison, the PSRACS system's QI use the stages of pressure injuries defined in the Pan Pacific Clinical Practice Guidelines for the Prevention and Management of Pressure Injuries. (Wounds Australia) -Accuracy of data collection depends on the competence of data collector to assess against levels
Tier 1	QI3: Proportion of pressure	QI Program (Victoria)	Same concept as QI1-2; uses Wound Australia Classification				

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	injuries (at each stage)[20]						
Tier 1	QI4: Presence of a pressure injury (including levels 1–4)[21]	Research Study (Victorian Data)	Same concept as QI1-2				
Tier 1	QI5: Total pressure injuries (Stage 2 or above) per care recipient	South Korea	The number of patients with a second stage or above pressure injury assessed as a particular point in time. Pressure injuries defined pressure ulcer according to the National Pressure Ulcer Advisory Panel (NPUAP) (see above).	Not reported in the English language literature sourced.	Numerator: Number of subjects with pressure ulcer at a specific time point (period). Denominator: Number of subjects assessed at a specific time point (period).	QI5: Percentage of subjects with at least one pressure ulcer of second stage or above that satisfies the definition of pressure ulcer according to the National Pressure Ulcer Advisory Panel. (NPUAP) at a specific time point (period)[22]	There is some evidence in the literature suggesting that reporting of this QI should be restricted to stages two and above due to limited reliability. Caveats: One small study in a Korean long-term care hospital used electronic medical records to identify outcome and risk factors for pressure injury. The study found risk adjustment factors for pressure ulcer development (found from literature review) using electronic medical records for 127 patients admitted to a long-term care hospital in South Korea.

[20] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government. 2015.

[21] Moore KJ, Doyle CJ, Dunning TL, Hague AT, Lloyd LA, Bourke J, et al. Corrigendum to: Public sector residential aged care: identifying novel associations between quality indicators and other demographic and health-related factors. Australian Health Review: A Publication Of The Australian Hospital Association. 2015;39(1):120.

[22] Lee YJ, Kim JY, Dong CB, Park OK. Developing risk-adjusted quality indicators for pressure ulcers in long-term care hospitals in the Republic of Korea. Int Wound J. 2019;16:43-50; Moore KJ, Doyle CJ, Dunning TL, Hague AT, Lloyd LA, Bourke J, et al. Corrigendum to: Public sector residential aged care: identifying novel associations between quality indicators and other demographic and health-related factors. Australian Health Review: A Publication Of The Australian Hospital Association. 2015;39(1):120.

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 1	QI6: Total high-risk care recipients with Stage II-IV or unstageable pressure injuries	USA	Count of pressure ulcers, defined as any lesion caused by unrelieved pressure and classified as: - Any area of persistent redness Partial loss of skin layers - Deep craters in the skin - Breaks in the skin exposing muscle or bone. Residents are defined as high-risk if they meet one or more of the following three criteria on the MDS assessment: -Impaired bed mobility or ability to transfer -Comatose -Malnutrition or at risk of malnutrition.	All residents of nursing homes in the USA that receive Government funding. Target assessment: The most recent 3 months.	Numerator: All long-stay high-risk residents who have a Stage II-IV or unstageable pressure ulcer. Denominator: All long-stay residents who meet the definition of high risk. Exclusions: Short-stay, low-risk.	QI6: The percentage of long-stay, high-risk residents with Stage II-IV or unstageable pressure ulcers ("high-risk" is defined in the denominator definition)[23]	The MDS system for classification uses an adapted version of the NPUAP. Pressure injuries are classified into five categories, using similar assessment criteria for Stages 1-4 and combines all other stages into one category "Unstageable". This QI demonstrates high adoption via the MDS where there has been a long history of use. Inclusionary criteria (e.g. high risk only) acts to improve specificity. This may allow more meaningful and targeted quality improvement initiatives.

[23] Castle NG, Ferguson-Rome JC. Influence of Nurse Aide Absenteeism on Nursing Home Quality. The Gerontologist. 2015;55(4):605-15; Li Y, Li Q, Tang Y. Associations Between Family Ratings on Experience With Care and Clinical Quality-of-Care Measures for Nursing Home Residents. Med Care Res Rev. 2016;73(1):62-8; RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International 2019; Xu D, Kane R, Arling G. Relationship between nursing home quality indicators and potentially preventable hospitalisation. BMJ Qual Saf. 2019;28(7):524-33; Xu D, Kane RL, Shippee T, Lewis TM. Identifying Consistent and Coherent Dimensions of Nursing Home Quality: Exploratory Factor Analysis of Quality Indicators. J Am Geriatr Soc. 2016;64(12):e259-e64

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period.				
Tier 1	QI7: Care recipients with timely re-assessment for the risk of developing pressure injuries after: - surgical or interventional procedure - change in their care environment following a transfer	UK	Evidence of local arrangements to ensure that healthcare professionals know how to carry out a risk assessment to reassess the risk of developing pressure ulcers. Number of surgical or interventional procedures or changes in care environment following a transfer that have a pressure ulcer risk and require a reassessment carried out afterwards.	Local data collection of patient level data.	Numerator: All patients in participating NHS Trusts. Denominator: All patients in participating NHS who have their data collected and recorded (local data collection).	QI7: People have their risk of developing pressure ulcers reassessed after a surgical or interventional procedure, or after a change in their care environment following a transfer	Guidance should include the definition of timely. See further guidance from NICE below: NICE recommends: "Pressure ulcer risk status is not constant and is likely to change during the course of care. A pressure ulcer risk assessment should be repeated if there is a change in a person's clinical status. However, changes in clinical status can be difficult to define. Specific instances where a reassessment should be carried out to ensure patient and service user safety have been identified as after a surgical or interventional procedure in hospital, and after a person's care environment changes following a transfer in any setting."
Tier 1	QI8: Care recipients who developed a Stage II to IV pressure injury since last assessment	Canada	Count of pressure ulcers, defined as any lesion caused by unrelieved pressure and classified as: -Any area of persistent redness -Partial loss of skin layers	MDS assessments are performed on all residents of nursing homes in the USA that are eligible to receive funding from Medicare or Medicaid. This includes long-stay residents as	Numerator: All long-term residents who developed a Stage II-IV pressure ulcer since last assessment. Denominator: All long-term residents assessed for pressure	QI8: Percentage of long-term residents who developed a Stage II to IV pressure ulcer since their	Key considerations include: The MDS system for classification uses an adapted version of the NPUAP. Pressure injuries are classified into five categories, using similar assessment criteria for Stages I-IV and combines all other stages into one category "Unstageable". Similar to QI5, this QI limits monitoring of QI to Stages II-IV, of which there is greater evidence for reliability and accuracy. This QI demonstrates high adoption in the USA via the MDS. Exclusionary criteria (e.g. low risk or short-stay) acts to improve specificity of measurement to those populations most at risk. This may allow more meaningful and targeted quality improvement initiatives.

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	Proposed wording of QI	Currently used	What is collected	How is it collected	Calculation of reporting method	Source wording of QI	Notes (if applicable)
			-Deep craters in the skin -Breaks in the skin exposing muscle or bone. Short-stay defined as: An episode with Cumulative days in the facility (CDIF) less than or equal to 100 days as of the end of the target period.	well as people in nursing homes for short-stay rehabilitation or skilled nursing care following acute care hospitalisation. Target assessment: The most recent 3 months.	ulcers in the last quarter. Exclusions: Short-stay, low-risk.	previous assessment[24]	
Tier 1	QI9: Care recipients whose Stage II to IV pressure injury worsened	Canada	Count of pressure ulcers, defined as any lesion caused by unrelieved pressure and classified as: -Any area of persistent redness -Partial loss of skin layers -Deep craters in the skin -Breaks in the skin exposing muscle or bone. Residents are defined as high-risk if they meet	MDS assessments are performed on all residents of nursing homes in the USA that are eligible to receive funding from Medicare or Medicaid. This includes long-stay residents as well as people in nursing homes for short-stay rehabilitation or skilled nursing care following	Numerator: All long-stay high-risk residents whose pressure ulcer was recategorised into a higher (more serious) stage. Denominator: All long-stay high-risk residents where observation of a Stage II-IV pressure ulcer was recorded in last assessment. Exclusions: Short-stay, low-risk, Pressure ulcers	QI9: Percentage of long-term residents whose Stage II to IV pressure ulcer worsened[25]	

[24] Health Quality Ontario. LTC Indicator Review Report: The review and selection of indicators for long-term care public reporting review and selection of indicators for long-term care public reporting. Ontario, Canada: Health Canada; 2015; RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

[25] Health Quality Ontario. LTC Indicator Review Report: The review and selection of indicators for long-term care public reporting review and selection of indicators for long-term care public reporting. Ontario, Canada: Health Canada; 2015; RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			one or more of the following three criteria on the MDS assessment: -Impaired bed mobility or ability to transfer -Comatose -Malnutrition or at risk of malnutrition Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period.	acute care hospitalisation. Target assessment: The most recent 3 months.	recategorised at lower (less serious) stage.		
Tier 1	QI10: Incidence of pressure injuries	Australia (research study)	Count of new occurrences of pressure injuries. Pressure injuries were defined as: -Stage 1, non-blanchable erythema - Stage 2, partial thickness skin loss -Stage 3, full thickness skin loss -Stage 4, full thickness tissue loss	Snapshot audits were conducted to identify total number of observed events per month or as one-off. Additional information not provided.	Not provided in the literature sourced.	QI10: Total number of new pressure injuries including all stages[26]	QI10 – QI11 are alternative QIs identified in two studies conducted in Australia. Similar considerations for their use apply: Measuring incidence of pressure injuries could be considered as an alternative QI for consideration. In this study, lower incidence rates of pressure injuries were associated with better levels of staff and patient experience. There is a lack of high quality evidence and information about this indicator in the published literature reviewed.

[26] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			-Unstageable pressure injury, depth unknown -Deep-tissue injury, depth unknown.				
Tier 1	QI11: Incidence rates of pressure injuries	Australia (longitudinal study)	Incidence of total pressure injuries.	Retrospective audit of clinical records. Information about stage was unavailable. Incidence rate calculated for each 3 month period between specified 2-year period.	Not provided in the literature sourced.	QI11: Incidence rates of pressure injuries[27]	
Tier 2	QI12: The Pressure Ulcer and Fall Rate Quality Composite Index	Not currently in use	Composite Indices are single measures that combine the strengths of two or more individual quality measures to enable comparisons. Pressure ulcer rates are defined as percentage of patients assessed who have a least one pressure ulcer that	Hospital based study. Data on pressure ulcer risk and prevention gathered during the same one-day assessment of hospital-acquired pressure ulcer rate plus cross sectional data from the year	Calculation = 100 – pressure ulcer rate – fall rate.	QI12: Pressure ulcer and fall rate composite index = 100 – PUR – FR[28]	While useful, composite measures are emerging in evidence and for use in Australia and internationally, these measures do not have the same quality of evidence published in the literature to date. Exploring utility and application for future incorporation into the QI program would be ideal. Benefits of composite measures include ability to compare relationships between two QIs and for benchmarking purposes.

[27] Jorgensen M, Siette J, Georgiou A, Westbrook JI. Longitudinal variation in pressure injury incidence among long-term aged care facilities. Int J Qual Health Care. 2018;30(9):684-91; Whitehead N, Parsons M, Dixon R, Robinson E. Quality and staffing: Is there a relationship in residential aged care. Kai Tiaki Nursing Research. 2015;6(1):28-35.

[28] Boyle DK, Jayawardhana A, Burman ME, Dunton NE, Staggs VS, Bergquist-Beringer S, et al. A pressure ulcer and fall rate quality composite index for acute care units: A measure development study. Int J Nurs Stud. 2016;63:73-81.

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	Proposed wording of QI	Currently used	What is collected	How is it collected	Calculation of reporting method	Source wording of QI	Notes (if applicable)
			developed after hospital admission. Fall rates are defined as total number of falls per 1000 patient days.	2013 National Database of Nursing Quality Indicators for analysis. Application and recommended frequency of use in Services not stated.			

Table 8: Detailed tables from evidence review of physical restraint Tier 1 and Tier 2 QIs

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 1	QI1: Total care recipients physically restrained	Australia (Research Study)	Physical restraint was defined as the intentional act of restricting a resident's voluntary movement or behaviour using a device or physical force for behavioural purposes, including use of lap belts, table tops, posy restraints, wrist restraints, bedrails, water chairs, deep chairs.	Snapshot audits were conducted to identify the total number of residents who met criteria in the month. Additional information not provided.	Not detailed.	QI1: Proportion of residents with physical restraint[29]	Measuring the total number of residents who were physically restrained appears to be a less subjective measure, when clear definition is applied, than measuring intent. Though this was not specifically measured and reported in this paper. Through this study, this measure demonstrates application in Australian residential aged care services. Use of physical restraint was not associated with consumer or staff satisfaction in this study.
Tier 1	QI2: Care recipients in daily physical restraint over the last 7 days	Canada	Measures 7-day frequency of restraint use Long stay residents with a selected target assessment that indicates daily physical restraints defined as: -Trunk restraints used in bed -Limb restraint used in bed	Target assessment period: the most recent 3 months. E.g. observation once daily for 7 days Limited further information about collection.	Numerator: Long stay residents assessed as using daily physical restraints. Denominator: All long-stay residents assessed over the last quarter (target assessment).	QI2: Percentage of residents in daily physical restraints over the last 7 days[30]	This QI draws from well evidenced and adopted MDS assessments. This includes long-stay residents as well as people in nursing homes for short-stay rehabilitation or skilled nursing care following acute care hospitalisation. This QI differs from QI7 as it records assessments of physical restraints over a 7 day period within the last 30 days. Limited information is available around collection and recording guidance but may be available if a licensing arrangement was made for use of the QI. It may be useful to consult on the value of using alternative restraint categories as described in this indicator. It may also be useful to consult on the value of defining (or amending) the use of the term 'long stay' in the QI as this is not common nomenclature in the Australian context. Additional studies were identified that used the MDS physical restraint use QI to explore associations with other factors such as staffing mix, capability and availability. Though using the

[29] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41.

[30] Canadian Institute for Health Information. Long-Term Care Report on Quality Indicators. Canadian Institute for Health Information; 2018; Health Quality Ontario. Results from Health Quality Ontario's Benchmark Setting for Long-Term Care Indicators. Ontario, Canada: Health Canada; 2017; RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			-Trunk restraint used in chair or out of bed -Limb restraint used in chair or out of bed -Chair prevents rising used in chair or out of bed. Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period. Short-stay defined as: An episode with Cumulative days in the facility (CDIF) less than or equal to 100 days as of the end of the target period.		Exclusions: Short-stay residents.		same MDS system to measure quality, there were some differences in how QIs were analysed and reported. These include: "percent of residents with physical restraint use" and "percent of patients in a physical restraint device".[31] Consultations could explore simplifying what the QI measures to allow flexibility in how it's reported e.g. as a percentage, prevalence or prevalence rate.
Tier 2	QI3: Use of physical	QI Program	Counts intent to restrain, defined as the intentional	Total of nine observation assessments	Numerator: The total number of intents to restrain a	QI3: Number of intents to restrain[32]	QIs in the QI Program measure the same QI measurement concepts as the Victorian program and as such, considerations for QI3 - QI6 are similar. Key considerations include:

[31] Castle NG, Ferguson-Rome JC. Influence of Nurse Aide Absenteeism on Nursing Home Quality. The Gerontologist. 2015;55(4):605-15; Castle NG, Furnier J, Ferguson-Rome JC, Olson D, Johs-Artisensi J. Quality of care and long-term care administrators' education: Does it make a difference? Health Care Manage Rev. 2015;40(1):35-45; Hefele JG, Ritter GA, Bishop CE, Acevedo A, Ramos C, Nsiah-Jefferson LA, et al. Examining Racial and Ethnic Differences in Nursing Home Quality. Jt Comm J Qual Patient Saf. 2017;43(11):554-64; McGarry BE, Joyce NR, McGuire TG, Mitchell SL, Bartels SJ, Grabowski DC. Association between High Concentrations of Seriously Mentally Ill Nursing Home Residents and the Quality of Resident Care. J Am Geriatr Soc. 2019; and Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41.

[32] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	restraint – intent to restrain		restriction of a care recipient's voluntary movement or behaviour by the use of a device, removal of mobility aids, or use of physical force for behavioural purposes	over the quarter: three observation audits (morning, afternoon, night) in each of three assessment days in each quarter	care recipient at the time of the assessment Denominator: 1000 occupied bed days. Occupied bed days (OBD) is the number of days in care in the subsidy claiming system. Exclusions: Secure areas.		Measuring the concept of 'intent' is subjective and data collection may be subjected to reliability concerns. No evidence was found in other QI programs of QIs that incorporate the concept of 'intent' to restrain in the indicator itself. The concept of 'intent' is usually clarified in inclusion/exclusion criteria or measurement guidance. Therefore we have suggested removing the term 'intent' in the proposed QI wording. There are a number of interpretation issues raised for inclusion and exclusion criteria (e.g. secure areas). QI collection: Some services have reported challenges with interpreting whether common objects should be counted as a restraint e.g. an adjustable bed rail. The definition for what constitutes a restraint is in line with international literature and is well adopted. Alternative approaches to defining restraint devices include measuring the type of restraint e.g. trunk restraint, limb restraint (see QI2). Consultations could include discussions on what should be considered as a restraint QI utility: A single resident for whom restraints are observed may contribute to a large number of recorded occurrences which cannot be compared with the proportion of residents restrained. QI implementation: The unannounced observational audit undertaken morning, afternoon and night may need training of additional staff to participate in the data collection process and is resource intensive.
Tier 2	QI4: Use of physical restraint – use of physical restraint devices	QI Program	Counts physical restraint devices in use at the time of the assessments (exhaustive): -bed rails -chairs with locked tables -seatbelts other than those used during active transport -safety vests -shackles -manacles. These are to be counted whether or not they are	Total of nine observation assessments over the quarter: three observation audits (morning, afternoon, night) in each of three assessment days in each quarter	Numerator: Number of restraint devices used (for any reason) from three observation audits on three observation days Denominator: 1000 occupied bed days. Occupied bed days (OBD) is the number of days in care in the subsidy claiming system. Exclusions: Secure areas.	QI4: Number of restraint devices used[33]	

[33] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			being used to intentionally restrain a care recipient				
Tier 2	QI5: Proportion of intent to restrain care recipients[34]	QI Program (Victoria)	Same concept as QI3				
Tier 2	QI6: Proportion of physical restraint devices used[35]	QI Program (Victoria)	Same concept as QI4				
Tier 2	QI7: Percentage of care recipients restrained	USA	Not detailed			QI7: Percent of residents with physical restraint use[36]	This QI draws from well evidenced and adopted MDS assessments (as outlined in QI2).
Tier 2	QI8: Percentage of care recipients restrained	USA	Not detailed, trialled in American hospital setting only.			QI8: Percent of patients in a	This QI draws from well evidenced and adopted MDS assessments (as outlined in QI2).

[34] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[35] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[36] Castle NG, Ferguson-Rome JC. Influence of Nurse Aide Absenteeism on Nursing Home Quality. The Gerontologist. 2015;55(4):605-15; Castle NG, Furnier J, Ferguson-Rome JC, Olson D, Johs-Artisensi J. Quality of care and long-term care administrators' education: Does it make a difference? Health Care Manage Rev. 2015;40(1):35-45; Hefele JG, Ritter GA, Bishop CE, Acevedo A, Ramos C, Nsiah-Jefferson LA, et al. Examining Racial and Ethnic Differences in Nursing Home Quality. Jt Comm J Qual Patient Saf. 2017;43(11):554-64; McGarry BE, Joyce NR, McGuire TG, Mitchell SL, Bartels SJ, Grabowski DC. Association between High Concentrations of Seriously Mentally Ill Nursing Home Residents and the Quality of Resident Care. J Am Geriatr Soc. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
						physical restraint device[37]	

[37] Cosper P, Morelock V, Provine B. Please Release Me: Restraint Reduction Initiative in a Health Care System. J Nurs Care Qual. 2015;30(1):16-23.

Table 9: Detailed tables from evidence review for unplanned weight loss Tier 1 and Tier 2 QIs

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 1	QI1: The total number of care recipients who experienced a significant unplanned weight loss in the quarter	QI Program	The number of care recipients who experienced significant unplanned weight loss over the three month period equal to or greater than three kilograms.	Last weight last quarter and last weight this quarter Monthly weighing of care recipients Quarterly weight assessment, this can only be determined if the care recipient is weighed compared to the end of last quarter weight	Numerator: Number of residents who experienced an unplanned weight loss of 3kg or more. Denominator: Number of residents whose weight was monitored. QI converted to a rate per 1000 occupied bed days. Exclusions: -Care recipients who are absent, e.g. in hospital -Care recipients receiving end-of-life palliative care -Respite care recipients -Care recipients not weighed on all three occasions over the quarter	QI1: Residents with significant unplanned weight loss[38]	QI1 and QI9 are those used in the current QI Program and are similar to the Victorian QIs (QI2 and QI10 respectively). As such, key considerations for use of QI1 and QI9 include: Definition of QI: While QIs for weight loss are common, many vary in relation to the amount of weight loss measured and the time period of measurement. The definition of 'significant weight loss' is currently defined as equal to or greater than 3 kilograms for the QI Program. The Victorian QIs set up lower target rate (0.2) and upper limit rate (1.0) for significant weight loss per 1000 occupied bed days and lower target rate of zero and upper limit rate (1.0) for consecutive weight loss per 1000 occupied bed days. These QIs are being implemented in public sector residential aged care services in Victoria and have shown that it can be used for informing quality improvement activities and risk management of unplanned weight loss. Guidance on expected range of performance of QIs in unplanned weight loss might be considered for the QI Program. Most QIs identified focus on weight loss as an outcome measure. It is possible that a new indicator could be considered (and tested through consultation in the next phase of the project) - an indicator assessing the proportion of residents experiencing malnutrition.

[38] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
					This can only be determined if the care recipient is weighed on all three occasions.		
Tier 1	QI2: Care recipients with significant unplanned weight loss (≥3 kgs) over a 3 month period[39]	QI Program (Victoria)	Same concept as QI1	QI2: The proportion of residents with significant unplanned weight loss (≥3 kgs) over a 3 month period[40]			
Tier 1	QI3: Care recipients who lose too much weight (5% or more in one month and 10% or more in 6 months)	USA	Compares the resident's weight in the current observation period with their own weight at two snapshots in time: -At a point closest to 30-days preceding the current weight	Weight loss is measured as a weight loss of five percent or more in the last month or 10 percent or more in the last two quarters (six months).	Numerator: Long-stay nursing home residents with a selected target assessment which indicates a weight loss of 5 percent or more in the last month or 10 percent or more in the last 6 months who were not on a physician	QI3: The percentage of long stay residents who lose too much weight[41]	This is an MDS indicator. It may also be useful to consult on the value of defining (or amending) the use of the term 'long stay' in the QI as this is not common nomenclature in the Australian context.

[39] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[40] Moore KJ, Doyle CJ, Dunning TL, Hague AT, Lloyd LA, Bourke J, et al. Public sector residential aged care: identifying novel associations between quality indicators and other demographic and health-related factors. Aust Health Rev. 2014;38(1):325-31; Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[41] RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			-At a point closest to 180-days preceding the current weight. Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period.		prescribed weight-loss regimen. Denominator: Long-stay nursing home residents with a selected target assessment. Exclusions: -Prognosis of life expectancy is less than 6 months -Receiving Hospice care.		
Tier 1	QI4: Unplanned weight loss of 2kg or more in a month	Research Study (Australia)	Proportion of residents with unplanned or unintentional weight loss (>2 kgs) within 1 month	A retrospective analysis of national audit data collected from 426 facilities between 2015 and 2016 was performed to identify the total number of residents who met criteria in the month.	Not provided	QI4: Unplanned weight loss[42]	This QI measures the same concept as the preceding indicators and uses a different threshold of weight loss and timeframe. This has demonstrated use in Australia and in Services.
Tier 1	QI5: Proportion of care recipients without	Not currently in use	Not comprehensively detailed. Data from this study used				

[42] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41; Jeon YH, Simpson JM, Li Z, Cunich MM, Thomas TH, Chenoweth L, et al. Cluster Randomized Controlled Trial of An Aged Care Specific Leadership and Management Program to Improve Work Environment, Staff Turnover, and Care Quality. J Am Med Dir Assoc. 2015;16(7):629.e19-.e28.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	unexplained weight loss since previous assessment[43]		data from the Centers for Medicare & Medicaid Services (CMS) database for analysis. CMS data is publically reported and weight loss measures draw from MDS system, which is widely adopted across the USA.				
Tier 1	QI6: Inadequate Meals - Care recipients who ate less than 1 meal in 2 of the last 3 days	USA	Derived from the InterRAI system, which is widely adopted internationally. Given wide adoption, good guidance for risk adjustment and demographic benchmarking is available.				
Tier 1	QI7: Unplanned weight loss of more than 5 % over 30 days	Finland	Not comprehensively detailed. Numerator: Residents who experienced weight loss of more than 5% of body weight			QI7: Prevalence of unplanned weight loss (more than 5% over 30 days or more than 10% over 180 days).	

[43] Hefele JG, Ritter GA, Bishop CE, Acevedo A, Ramos C, Nsiah-Jefferson LA, et al. Examining Racial and Ethnic Differences in Nursing Home Quality. Jt Comm J Qual Patient Saf. 2017;43(11):554-64.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			over 30 days OR more than 10% of body weight over 180 days. Denominator: All long term care residents.			Note: split into QI7 and QI8	
Tier 1	QI8: Unplanned weight loss of more than 10% over 180 days	Finland				QI7: Prevalence of unplanned weight loss (more than 5% over 30 days or more than 10% over 180 days). Note: split into QI8 and QI7 (as described above).	
Tier 2	QI9: The total number of care recipients who experienced consecutive unplanned weight loss in the quarter	QI Program	The number of care recipients experiencing unplanned weight loss of any amount every month over the three consecutive months of the quarter	Last weight last quarter and all three monthly weights for the current quarter Monthly weighing of care recipients Quarterly weight assessment This can only be determined if the	Numerator: Number of residents who experienced unplanned weight loss over the 3 consecutive months of the quarter Denominator: Number of residents whose weight was monitored. QI converted to a rate	QI9: Residents with consecutive unplanned weight loss[44]	QI9 and QI1 are those used in the current QI Program and are similar to the Victorian QIs (QI10 and QI2 respectively). As such, key considerations for use of QI9 and QI1 include: Definition of QI: While QIs for weight loss are common, many vary in relation to the amount of weight loss measured and the time period of measurement. The definition of 'significant weight loss' is currently defined as equal to or greater than three kilograms for the QI Program. The Victorian QIs set up lower target rate (0.2) and upper limit rate (1.0) for significant weight loss per 1000 occupied bed days and lower target rate of zero and upper limit rate (1.0) for consecutive weight loss per 1000 occupied bed days. These QIs are being implemented in public sector residential aged care services in Victoria and have shown that it can be used for informing quality improvement activities and risk management of unplanned weight loss. Guidance on expected range of performance of QIs in unplanned weight loss might be considered for the QI Program.

[44] Department of Health. National Aged Care Mandatory Quality Indicator Program Manual 1.0. 2019.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
				care recipient is weighed on all three occasions (monthly)	per 1000 occupied bed days Exclusions: -Care recipients who are absent, e.g. in hospital -Care recipients receiving end-of-life palliative care -Respite care recipients -Care recipients not weighed on all three occasions over the quarter. This can only be determined if the care recipient is weighed on all three occasions.		Most QIs identified focus on weight loss as an outcome measure. It is possible that a new indicator could be considered (and tested through consultation in the next phase of the project) - an indicator assessing the proportion of residents experiencing malnutrition.
Tier 2	QI10: Care recipients with any unplanned weight loss in every month over a 3 month period	QI Program (Victoria)	Same concept as QI9			QI10: The proportion of residents with any unplanned weight loss every month over a 3 month period[45]	
Tier 2	QI11: Percentage of care recipients	NICE UK	Assesses evidence of local arrangements to ensure that people in	Malnutrition Universal Screening Tool	Numerator: The number of people in the	QI11: Proportion of care recipients	Process indicator exploring percentage of people screened for malnutrition risk. Linked to outcome indicator to measure incidence of people at risk of malnutrition.

[45] Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	screened for malnutrition risk		care settings are screened for the risk of malnutrition using a validated screening tool, carried out by health and social care professionals who have undertaken training to use a validated screening tool and have access to suitably calibrated equipment to enable accurate screening to be conducted.	(MUST) audit tool.	denominator who are screened monthly for the risk of malnutrition. Denominator: The number of people in community care settings.	screened monthly for malnutrition[46]	The ICD-10 definition for malnutrition measures the degree of malnutrition as the number of standard deviations from the mean of the relevant reference population and could be considered an alternative way to both measure and report on this indicator. Based on this definition, a high probability of: severe malnutrition is indicated if observed weight is three or more standard deviations below the mean value of the reference population; moderate malnutrition for an observed value located between two and less than three standard deviations below this mean; mild malnutrition for an observed value located between one and less than two standard deviations below this mean. ICD-10AM based criteria for the diagnosis of mild malnutrition is BMI less than 18.5kg/m^2 or unintentional weight loss 5-9% NICE UK provides three options for the diagnosis of malnutrition: 1. BMI < 18.5kg/m2 2. Weight loss 10% 3-6 months 3. BMI < 20kg/m2 and weight loss 5-9% Malnutrition and screening tools: There are a number of validated malnutrition screening and assessment tools, recently summarised by Queensland Health. Recent reviews comparing the use of screening tools in community, hospital and residential aged care settings highlight variations in performance and scientific properties. Few tools appear to perform well in residential aged care settings and generally, there is little evidence for use of these tools in these settings The Short Nutritional Assessment Questionnaire for Residential Care (SNAQ-RC) appears to be the preferred tool by way of validity. Other tools used in these settings include the Mini Nutritional Assessment – Short Form (MNA-SF) and the Malnutrition Universal Screening Tool (MUST) and although used more regularly, there is evidence that this tend to perform 'fair' to 'poorly' when applied in residential aged care settings.

[46] National Institute for Health and Excellence, NICE Guidance, Quality Standards.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 2	QI12: Care recipients screened monthly for malnutrition risk	UK	As above	As above	Numerator: The number of people in the denominator who are screened monthly for the risk of malnutrition. Denominator: The number of people in community care settings.	QI12: Proportion of care recipients screened monthly for malnutrition[47]	Process indicator exploring percentage of people screened for malnutrition risk monthly. Linked to outcome indicator to measure people at risk of malnutrition.
Tier 2	QI13: Prevalence of weight loss ≥4 percent in the previous year[48]	Sweden	Not comprehensively detailed. Weight loss in this study was a predictor of institutionalisation for people with dementia.				
Tier 2	QI14: Timely Nutritional Risk Assessment has been performed for the care recipient	UK	This measure captures the answers below in the web tool Yes – assessment indicates malnourished Yes – assessment indicates at risk of malnutrition	Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required	The NHFD has 100% compliance in the NHS- >70,000 patients annually. Numerator: All patients aged 60 and over at risk. Denominator: All patients as per	QI14: Nutritional Risk Assessment Performed on Admission[49]	Assessment tool can be site specific, however in this study, use of the MUST tool demonstrated good reliability between health care workers and fair-good-to-excellent agreement with regards to the detection of malnutrition compared with other tools. Process indicators were also explored in this study. These included: use of a nutritional screening tool; presence of protocols and guidelines for weight assessment; presence of protocols and guidelines for administration of food; and assessment of dysphagia. Study limitations noted that while structural and process indicators are useful, variability in the effective use of supporting tools and mode/frequency of documentation creates limitations with using such indicators.

[47] National Institute for Health and Excellence, NICE Guidance, Quality Standards.

[48] Bökberg C, Ahlström G, Karlsson S. Significance of quality of care for quality of life in persons with dementia at risk of nursing home admission: a cross-sectional study. BMC Nurs. 2017;16:1-1.

[49] Royal College of Physicians. Falls and Fragility fracture Audit Programme (FFFAP). Healthcare Quality Improvement Partnership; 2015.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			Yes – assessment indicates normal This data is reported publicly on the NHFD web tool (National Hip Fracture Database-Falls and Fragility Fracture Audit Programme).		above criteria that were entered on to the web tool by the cut off dates.		
Tier 2	QI15: Total care recipients with nutrition enquiry completed	Netherlands	Not comprehensively detailed. This appears to be one of the 18 QIs in residential aged care in the Netherlands. Based on engagement with the sector, some are already measuring a similar indicator. This could require further investigation and development and could potentially be renamed as 'Percentage of residents with nutritional assessment within 3 days of admission' or into an ongoing nutritional assessment process indicator.				
Tier 2	QI16: Care recipients with unplanned weight loss	Portugal	Not comprehensively detailed. Numerator: Patients with unplanned weight loss Denominator: Patients treated in inpatients units and home care This has been applied in home care and inpatient setting.				

Table 10: Detailed tables from evidence review for falls and fractures Tier 1 and Tier 2 QIs

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
Tier 1	QI1: Total falls at a service	QI Program (Victoria)	A fall is defined as an event that results in a person coming to rest inadvertently on the ground or floor or other lower level.	Quarterly audit of resident records and incident reports, where number of falls.	Numerator: Total number of falls. Denominator: 1000 occupied bed days. Exclusions: Falls that occur while the resident is away from a residential aged care service and is not under direct supervision of residential aged care staff.	QI1: Proportion of falls (Number of falls per 1000 occupied bed days)[50]	This QI is in current use in residential aged care services in Australia. Use of this QI as it is currently articulated in the source QI would require continued licence from the Victorian Government. The QI measures total falls and not number of residents who fall, meaning one resident could contribute a disproportionately high count to the overall number. The Victorian QI program defines a lower target rate and an upper limit rate (3.3; 11) for falls per 1000 occupied bed days. These QIs are being implemented in public sector residential aged care services in Victoria and that application suggests that it is feasible for wider application. A similar QI is also well adopted and used across NZ and OECD.
Tier 1	QI2: Total fall-related fractures	QI Program (Victoria)	A fracture is a traumatic injury to a bone in which the continuity of the bone tissue is broken. A fall-related fracture can be located on any area of the individual's body, and is not exclusive to areas traditionally	Quarterly audit of resident records and incident reports, where number of fall related fractures	Numerator: Total number of fall related fractures. Denominator: 1000 occupied bed days.	QI2: Proportion of fall-related fractures (Number of fractures resulting from falls per 1000 occupied bed days)[51]	This QI is in current use in residential aged care services in Australia. Use of this QI would require continued license from the Victorian Government. The Victorian QI program has a zero tolerance of falls resulting fractures. These QIs are being implemented in public sector residential aged care services in Victoria and that application suggests that it is feasible for wider application.

[50] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41; Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015; Whitehead N, Parsons M, Dixon R, Robinson E. Quality and staffing: Is there a relationship in residential aged care? Kai Tiaki Nursing Research. 2015;6(1):28-35.

[51] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41; Victorian

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
			associated with falls such as the hip	should be recorded.	Exclusions: Falls that occur while the resident is away from a residential aged care service and is not under direct supervision of residential aged care staff.		This QI could be considered for use as a sentinel indicator as the incidence is likely to be low. This will have implications on smaller services and the value of monitoring as a program indicator.
Tier 1	QI3: Care recipients who had falls	Canada	A fall is defined as an event that results in a person coming to rest inadvertently on the ground or floor or other lower level. Residential aged care services in Canada include long and short-stay residents. This indicator measures falls in the long-stay resident cohort. Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period.	Quarterly audit of resident records, where number of falls should be recorded.	Numerator: Total number of falls. Denominator: Total number of long-stay patients. Exclusions: Falls that occur while the resident is away from a residential aged care service and is not under direct supervision of	QI3: Percentage of long-stay residents who had falls[52]	It may also be useful to consult on the value of defining (or amending) the use of the term 'long stay' in the QI as this is not common nomenclature in the Australian context. Time frame for audit not defined but implies quarterly in line with audit timeframe.

Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

[52] Health Quality Ontario. LTC Indicator Review Report: The review and selection of indicators for long-term care public reporting review and selection of indicators for long-term care public reporting. Ontario, Canada: Health Canada; 2015; Health Quality Ontario. Results from Health Quality Ontario's Benchmark Setting for Long-Term Care Indicators. Ontario, Canada: Health Canada; 2017; Konetzka RT, Skira MM, Werner RM. Incentive Design and Quality Improvements: Evidence from State Medicaid Nursing Home Pay-for-Performance Programs. Am J Health Econ. 2018;4(1):105-30; Morris JN, Berg K, Topinkova E, Gray LC, Schachter E. Developing quality indicators for in-patient post-acute care. BMC geriatrics. BMC Geriatr. 2018;18:161.

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	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
			Short-stay defined as: An episode with Cumulative days in the facility (CDIF) less than or equal to 100 days as of the end of the target period.		residential aged care staff.		
Tier 1	QI4: Care recipients who fell in the last 30 days	Canada	A fall is defined as an event that results in a person coming to rest inadvertently on the ground or floor or other lower level.	An audit of total number of recorded falls at service over 30 days.	Numerator: The number of residents who had a fall in the 30 days leading up to the date of their quarterly clinical assessments Denominator: The number of all residents with valid assessments within the applicable time period Exclusions: Falls that occur while the resident is away from a residential aged care service and is not under direct supervision of residential aged care staff.	QI4: Percentage of residents who fell in the last 30 days[53]	The key difference in this QI from others that measure the same concept relates to the length of time for measurement. In this case, this QI is focused on the previous 30 days. Consideration should be given to clarifying data collection for this measure given the quarterly reporting schedule of the QI Program. This QI demonstrates high adoption via the MDS and has a long history of use.

[53] Canadian Institute for Health Information. Long-Term Care Report on Quality Indicators. Canadian Institute for Health Information; 2018; McArthur C, Hirdes J, Chaurasia A, Berg K, Giangregorio L. Quality Changes after Implementation of an Episode of Care Model with Strict Criteria for Physical Therapy in Ontario's Long-Term Care Homes. Health Serv Res. 2018;53(6):4863-85.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
Tier 1	QI5: Care recipients experiencing one or more falls with major injury	USA	This measure reports the percent of long-stay residents who have experienced one or more falls with major injury reported in the target period or look-back period. A fall is defined as an event that results in a person coming to rest inadvertently on the ground or floor or other lower level. Major injury is defined as bone fractures, joint dislocations, closed head injuries with altered consciousness, subdural haematoma	Audit looking at retrospective assessments for most recent 3 months.	Numerator: Long-stay residents with one or more retrospective scan assessments that indicate one or more falls that resulted in major injury Denominator: All long-stay nursing home residents with one or more retrospective scan assessments except those with exclusions Exclusions: Resident is included if one of the following is true following a look-back scan: - where the occurrence of falls was not assessed -assessment indicates that a fall occurred and the number of falls with	QI5: Percentage of residents experiencing one or more falls with major injury[54]	The key differentiator for this QI from others than measure injuries is the level of specificity about what type of injuries are to be included in data collection. Many QIs restrict only to fractures as the resulting injury, which then under-report falls that cause other serious injuries. It may also be useful to consult on the value of defining (or amending) the use of the term 'long stay' in the QI as this is not common nomenclature in the Australian context. This QI demonstrates high adoption via the MDS and has a long history of use.

[54] RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019; Xu D, Kane R, Arling G. Relationship between nursing home quality indicators and potentially preventable hospitalisation. BMJ Qual Saf. 2019;28(7):524-33.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
					major injury was not assessed.		
Tier 1	QI6: Percentage of care recipients with a continence or toileting care plan	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	Continence care plans should be inclusive of capturing nocturia - a risk for falls in this patient cohort overnight. Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required.	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours. Denominator: The number of patients with valid assessments with in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression) .	QI6: Does the patient have an up to date continence or toileting care plan (tailored to the patient, not generic)[55]	Consider adding guidance as to the timeliness of assessment- i.e.: • Upon admission • Regularly (to be defined) • If there are any significant changes to continence or toileting- e.g. surgical interventions. Other notes on data collection: For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record. Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.
Tier 1	QI7: Percentage of care recipients	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and	Data collection will be via web-tool with audit questions being	Numerator: The number of patients over 65	QI7: Has the patient had a measurement of	The assessment of geriatric patients for postural hypotension is not common practice in Australia. The latest research from the NHS, included in the dataset for National Audit of Inpatient Falls is inclusive of measurement of lying and standing

[55] United Kingdom Royal College of Physicians. Falls and Fragility Fracture Audit Programme (FFFAP). 2013

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
	with recent measurement of their lying and standing blood pressure		Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%)	available as a printable PDF for local data collection on paper as required For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record.	years old and in the hospital for less than 72 hours. Denominator: The number of patients with valid assessments with in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).	their lying and standing blood pressure[56]	blood pressure manually to ensure accurate diagnosis and treatment of postural hypotension. The FFFAP London provide two tools for staff assessing blood pressure of patients: • Lanyard cards with procedure • Full lying and standing BP procedure. Other information on data collection: Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.
Tier 1	QI8: Percentage of care recipients with recent assessment for medication that increases falls risk	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who	Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required.	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours. Denominator: The number of patients with valid assessments with	Q8: Has the patient had an assessment for medication that increases falls risk[57]	Need to include guidance as to what specific medications increase falls risk. Particularly given the auditing is likely to be done by a non-clinical person. Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors.

[56] United Kingdom Royal College of Physicians. Falls and Fragility Fracture Audit Programme (FFFAP). 2013

[57] United Kingdom Royal College of Physicians. Falls and Fragility Fracture Audit Programme (FFFAP). 2013

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
			received as assessment/ intervention. Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record	in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).		Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.
Tier 1	QI9: Percentage of care recipients with recent vision assessment	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention. Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required. For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours. Denominator: The number of patients with valid assessments with in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is	QI9: Has the patient had an assessment of vision	In the NHS they provide a vision assessment tool to be used at the beside to ensure consistency. Further guidance around vision aids and minimum requirement for vision to reduce falls risk if potentially required. Additional notes on collection: Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
					combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).		
Tier 1	QI10: Percentage of care recipients with call bell within sight and reach of when they are alone	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention. Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required.	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours Denominator: The number of patients with valid assessments with in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).	Q10: Is the call bell within sight and reach of the patient	Guidance materials define if and when call bells needs to be within reach of the care recipient. In addition guidance around levels of care and this requirement- e.g., fully ambulant and self-sufficient patients may not need to be included. Additional Collection Measures: For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record. Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
Tier 1	QI11: Percentage of care recipients with appropriate mobility aid in reach	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention. Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	Data collection will be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required. For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours. Denominator: The number of patients with valid assessments with in the allocated time period. Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).	QI11: Is there an appropriate mobility aid in reach.	There is a need to consider guidance around care recipient assessment of their requirement for mobility aid. Additional Collection Measures: Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment
Tier 1	QI12: Percentage of care recipients that received a specialist falls assessment	USA	This measure is inclusive of a series of several questions: -Falls history on admission -Falls since admission.	Federally mandated process for clinical assessment of all residents in Medicare and	Numerator: All patients that are admitted to a Medicare or Medicaid Nursing home in the USA. Denominator: All eligible patients	QI12: Multifactor Falls Assessment	Requirement to further consider guidance around appropriate staff to perform falls risk assessment. See below guidance from the National Hip Fracture Database (NHS) *"This is defined as a systematic assessment by a suitably trained person e.g. geriatrician or a specialist assessment trained nurse, which must cover the following domains: - falls history (noting previous falls) - cause of index fall (including medication review) 43 Field Format Validation Status Why required Notes - risk factors for falling and injury (including fracture) -from this information a plan of action to prevent further falls should be formulated and documented."*

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
				Medicaid certified nursing homes	where data is collected and reported on within the time period. Exclusion: Care recipients discharged from a nursing home.		
Tier 2	QI13: The Pressure Ulcer and Fall Rate Quality Composite Index	Not currently in use	Composite Indices are single measures that combine the strengths of two or more individual quality measures to enable comparisons. Pressure ulcer rates are defined as percentage of patients assessed who have a least one pressure ulcer that developed after hospital admission. Fall rates are defined as total number of falls per 1000 patient days.	Hospital based study. Data on pressure ulcer risk and prevention gathered during the same one-day assessment of hospital-acquired pressure ulcer rate plus cross sectional data from the year 2013 National Database of Nursing Quality Indicators for analysis. Application and recommended frequency of use in Services not stated.	Calculation = 100 – pressure ulcer rate – fall rate.	QI13: The Pressure Ulcer and Fall Rate Quality Composite Index = 100 - PUR - FR[58]	While useful, composite measures are emerging in evidence and for use in Australia. Exploring utility and application for future incorporation into the QI program would be ideal. Benefits of composite measures include ability to compare relationships between two QIs and for benchmarking purposes.

[58] Boyle DK, Jayawardhana A, Burman ME, Dunton NE, Staggs VS, Bergquist-Beringer S, et al. A pressure ulcer and fall rate quality composite index for acute care units: A measure development study. Int J Nurs Stud. 2016;63:73-81.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source Wording of QI**	**Notes**
Tier 2	QI14: Percentage of care recipients assessed for the presence or absence of delirium	UK	Part of the NHS (National Audit of Inpatient Falls- Falls and Fragility Fracture Audit Programme). This measure reports the proportion (as a percentage) of patients per Hospital who received as assessment/ intervention. Sites are benchmarked against each other through transparency and public reporting of data and colour coding into: Green (80-100%) Yellow (50-19%) Red (0-49%).	Data collection I be via web-tool with audit questions being available as a printable PDF for local data collection on paper as required.	Numerator: The number of patients over 65 years old and in the hospital for less than 72 hours Denominator: The number of patients with valid assessments with in the allocated time period Exclusions: 1)>65 years of age 2)In Hospital >72 hours 3)<30 patients in Hospital- data is combined with other Trusts to ensure statistical relevance and for IG requirements (number suppression).	QI14: Percentage of care recipients recently and appropriately assessed for their state of mental cognition (e.g. AMT)[59]	There is need to add further guidance as to the usage of assessment tools and timeliness of assessment, including key definitions and explanations: • Upon admission • Regularly (to be defined) • If there are any noted changes to cognition • If there are any changes to medications or significant physical or psychological stressors that may impact cognition. Other notes on data collection: For each patient, look at all clinical notes (medical, nursing, therapies), including those at the end of the bed or in the patient vicinity, and any electronic record. Evidence of assessments (and the outcome of each assessment) will be derived from the case notes (Section 1). Section 2 will be direct observation on the same patients. It is recommended by NICE that interventions for falls prevention should be individualised to the patient following assessment for modifiable fall risk factors. Where an assessment has been carried out and no intervention is required, this would be considered as compliant with NICE. Where an assessment but no intervention has been carried out this is non- compliant. Where no assessment or intervention has been carried out, this would be non-compliant. Certain interventions are good practice for nearly all patients (e.g. access to a call bell), in which case there is no question on an associated assessment.
Tier 2	QI15: Percentage of care recipients as at risk of falling who received individualised	NZ	The Health Safety and Quality Commission uses the national minimum dataset (NMDS) to collect place of occurrence of falls.	Quarterly, based on the date of discharge of the last event in the stay.	Numerator: The number of acute and arranged admissions (stays) to hospital as the	Q15: Percentage of patients as at risk of falling who received individualised care	A target of 90 percent has been set for completed assessments and care plans. An evaluation of the program indicated high compliance for both indicators (at 92 percent) and a 20 percent reduction of falls over two years, with flow on cost benefits from (2140) bed days saved.

[59] United Kingdom Royal College of Physicians. Falls and Fragility Fracture Audit Programme (FFFAP). 2013

Detailed findings and assessment							
	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	Proposed wording of QI	Currently used	What is collected	How is it collected	Calculation of reporting method	Source Wording of QI	Notes
	care plans that addressed risks				result of a fall, by type of injury. Denominator: Number: None Rate per 1,000 population: Population estimates, smoothed across quarters	plans that addressed risks[60]	
Tier 2	QI16: Number and rate of acute falls, by place of occurrence	NZ	The Health Safety and Quality Commission uses the national minimum dataset (NMDS) to collect place of occurrence of falls.	Quarterly, based on the date of discharge of the last event in the stay.	Numerator: The number of acute and arranged admissions (stays) to hospital as the result of a fall, by type of injury Denominator: Number: None Rate per 1,000 population: Population estimates, smoothed across quarters.	Q16: Number and rate of acute/arranged falls hospital admissions, by place of occurrence[61]	This measure was first implemented in April 2017. Changes in October 2017: Methodology updated to identify stays more consistently with the Ministry of Health's methodology, and to include stays that started with an acute or arranged admission only. Data is available as a rolling twelve-month total, date is now the date of admission rather than the date of discharge.

[60] New Zealand Health Quality & Safety Commission. Falls and Fractures Outcomes Framework v1.1. January 2018.
[61] New Zealand Health Quality & Safety Commission. Falls and Fractures Outcomes Framework v1.1. January 2018.

Table 11: Detailed tables from evidence review for medication management Tier 1 and Tier 2 QIs

Detailed findings and assessment							
	Evidence review findings					**Additional considerations to adapt QI for consultation**	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
Tier 1	QI1: Care recipients receiving nine or more medications	QI Program (Victoria)	Evidence of polypharmacy, defined as 9 or more medications in medications chart.	Quarterly audit of resident medication charts and/or administration records, where each medicine is counted once regardless of the route of administration. To be collected in one week in the quarter. Note: Different doses or dosages of the same medicine are not counted as different medicines. Each medicine should be counted once,	Numerator: Number of residents receiving 9 or more different medicines Denominator: 1000 occupied bed days. Exclusions: -Lotions/creams/ ointments used in wound care -Dietary supplements, including those containing vitamins -Alcohol -Short-term medicines, such as antibiotics, temporary eye drops	QI1: Proportion of residents receiving nine or more medications[62]	Polypharmacy rates of 39 percent have been reported in Victoria. The Victorian QI Program set up lower target rate and upper limit rate (2.1; 3.5) for proportion of residents using nine or more different medications per 1000 occupied bed days. Evidence based guidance around polypharmacy suggests that the risk of adverse events increases with increasing medication load - there is minimal evidence around optimal frequency of review. In order to score medication QIs, consideration must be given to the presence of relevant diagnoses. For example, psychosis, major depression, dementia, etc. Some QIs will be hard to interpret without this information being available. The manner of recording diagnoses will need review if medication QIs are to be introduced.

[62] Jeon Y-H, Casey A-N, Fethney J, Poole B, Vo K, Rogers K. Associations between clinical indicators of quality and aged-care residents' needs and consumer and staff satisfaction: the first Australian study. Aust Health Rev. 2019;43(2):133-41; Moore KJ, Doyle CJ, Dunning TL, Hague AT, Lloyd LA, Bourke J, et al. Corrigendum to: Public sector residential aged care: identifying novel associations between quality indicators and other demographic and health-related factors. Australian Health Review: A Publication Of The Australian Hospital Association. 2015;39(1):120; Victorian Department of Health and Human Services. Quality indicators in public sector residential aged care services: Resource materials. Victoria: State Government; 2015.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
				regardless of the route of administration.	-PRN medicines -Different dosages of the same medicine are not counted as different medicines.		
Tier 1	QI2: Care recipients who received antipsychotic medication	Canada	Residents receiving antipsychotic medication to prompt review of appropriate use. Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period.	Review of resident medication charts and administrative records Frequency of review not reported.	Numerator: Number of residents receiving antipsychotic medication. Denominator: All residents. Exclusions: Short-stay residents.	QI2: Percent of residents who received antipsychotic medication (long-stay)[63]	The use of the term "chemical restraint" is challenging when defining a QI. Part of the challenge is around who (or what process) determines that a drug is being used for chemical restraint. The additional challenge is around reliability, for which there requires detailed, specific criteria. The most unambiguous approach is to count the number of residents prescribed the medication, and to use reported major diagnoses for which the medication is unequivocally required (e.g. psychosis) as exclusions. In order to score medication QIs, consideration must be given to the presence of relevant diagnoses. For example, psychosis, major depression, dementia, etc. Some QIs will be hard to interpret without this information being available. The manner of recording diagnoses will need review if medication QIs are to be introduced. Increased specificity is need of which medications are to be included in measurement of this indicator in an Australian context (using Australia market names for specific medication). Viability of review of medication records as the data collection method will need to be assessed through consultation and field testing. This offers a timely opportunity given the recent legislative changes requiring documentation in the consumers 'care and services plan'. It may also be useful to consult on the value of defining (or amending) the use of the term 'long stay' in the QI as this is not common nomenclature in the Australian context.
Tier 1	QI3: Care recipients who received anti-anxiety or hypnotic medication	USA	Residents receiving anti-anxiety or hypnotic medication to prompt review of appropriate use.	Review of resident medication charts and administrative records.	Numerator: Number of residents receiving anti-anxiety or hypnotic medication.	QI3: Percentage of residents who used anti-anxiety or	

[63] Canadian Institute for Health Information. Long-Term Care Report on Quality Indicators. Canadian Institute for Health Information; 2018; Health Quality Ontario. LTC Indicator Review Report: The review and selection of indicators for long-term care public reporting review and selection of indicators for long-term care public reporting. Ontario, Canada: Health Canada; 2015; Health Quality Ontario. Results from Health Quality Ontario's Benchmark Setting for Long-Term Care Indicators. Ontario, Canada: Health Canada; 2017; RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019; Xu D, Kane R, Arling G. Relationship between nursing home quality indicators and potentially preventable hospitalisation. BMJ Qual Saf. 2019;28(7):524-33.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
			Long-stay defined as: An episode with Cumulative days in the facility (CDIF) greater than or equal to 101 days as of the end of the target period. Short-stay defined as: An episode with Cumulative days in the facility (CDIF) less than or equal to 100 days as of the end of the target period.	Frequency of review not reported.	Denominator: All residents. Exclusions: Short-stay residents.	hypnotic medication (long-stay)[64]	
Tier 1	QI4: Medication errors resulting in an adverse event requiring intervention	Australia (Healthcare organisations)	Medication errors that result in adverse event. Adverse event is defined as an incident that results, or could have resulted in harm to a patient or consumer	Point in time clinical audit of health care organisations, against National Safety and Quality Health Service Standards Indicators. Frequency and time of audits not reported	Numerator: Number of medication errors resulting in an adverse event requiring intervention. Denominator: 1000 occupied bed days. Exclusions: None reported.	QI4: Prevalence of medication errors resulting in an adverse event requiring intervention[65]	Reliability and validity of this QI for use in the Australian residential aged care context will need to be tested as part of the field testing. Guidance for interpreting and data collection for this QI could be adapted from existing materials associated with this QI for the hospital context.
Tier 1	QI5: Care recipients	Canada	Percentage of Residents on	Quarterly audit of most recent	Numerator: Residents who	QI5: Potentially	Derived from the InterRAI system.

[64] RTI International. MDS 3.0 Quality Measures USER'S MANUAL. RTI International; 2019.

[65] Australian Council on Healthcare Standards. Australasian Clinical Indicator Report: 2010-2017: 19th Edition. Ultimo, NSW: Australian Council on Healthcare Standards; 2017.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	on antipsychotics without a diagnosis of psychosis		Antipsychotics Without a Diagnosis of Psychosis.	medication record.	received antipsychotic medications. Denominator: All residents with valid assessments. Exclusions: Schizophrenia, Huntington's chorea, delusions and hallucinations, and end-of-life resident.	Inappropriate Use of Antipsychotics in Long-Term Care[66]	
Tier 2	QI6: Care recipients using regular antipsychotic medicines	Not currently in use	Evidence of regular antipsychotic medication use. Definition for regular use not provided.	Point in time review of resident medication charts for use of antipsychotic medications and duration of use Frequency of recommended review not provided.	Numerator: Residents using antipsychotic medications Denominator: Number of residents receiving polypharmacy (defined as receiving 9 or more different medicines) Exclusions: None included.	QI6: The proportion of residents using regular antipsychotic medicines[67]	The use of QI6 will be subject to the same kinds of considerations as those outlined for Q2 and QI3 in relation to the need for specificity as to which medications are to be included and exclusionary criteria to account for underlying conditions were the use of the medication is clinically appropriate for that individual. Proposed QIs are best used in combination with a QI measuring polypharmacy for additional context. In addition to measuring polypharmacy, antipsychotic use may be useful to measure, given their high risk of adverse events and possible overuse in people with behavioural and psychological symptoms of dementia. Date of last medication review could also be included here.
Tier 2	QI7: Care recipients using regular	Not currently in use (pilot testing in	Evidence of regular proton pump inhibitor medication	Quarterly review of resident medication	Numerator: Residents using	QI7: The proportion of residents using	The Victorian QI Program has recently developed and pilot tested this indicator in Victorian residential aged care facilities. Similar indicators (proton pump inhibitor

[66] Canadian Institute for Health Information. Long-Term Care Report on Quality Indicators. Canadian Institute for Health Information; 2018.

[67] Picton L, et al. Validation and implementation of three new medicines-related quality indicator measures in residential aged care facilities. Melbourne: Monash University.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
	proton pump inhibitors	Victoria program)	use. Definition for regular use not provided.	charts for use of proton pump inhibitors and duration of use	proton pump inhibitors. Denominator: Number of residents. Exclusions: None included.	regular proton pump inhibitors[68]	specifically) were not found in the review of evidence of QIs although this was not exhaustive. Proposed QIs are best used in combination with a QI measuring polypharmacy for additional context. In addition to measuring polypharmacy, proton pump inhibitor use may be useful to measure since they are highly prevalent in residents with polypharmacy and are often continued for long periods of time without review. Date of last medication review could also be included here.
Tier 2	QI8: Number of medication errors by service	Not currently in use	Evidence for medication errors	Review Incident records for medication error incidents. Frequency of review six monthly	Not detailed.	QI8: Total number of medication errors for each of the participating wards[69]	Evidence reviewed by KPMG for the Department prior to 2015 indicates that QIs measuring incidence of over medication and/or medication error may also be viable for use in the QI Program under this domain. Whilst these are process measures, they can be useful ways to measure and prevent risk. Additional process measures for consideration include: - No medications review (within timeframe of 30, 60, 90 days) - Medications reconciliation or review is completed within 30 days post hospital discharge.
Tier 2	QI9: Care recipient with more than 4 regular medication administration times[70]	Not currently in use (pilot testing in Victoria program)	Evidence for complex medication regimens.	Quarterly review of resident medication charts to identify four or more differences in medication administration times.	Numerator: Residents with more than 4 regular medication administration times. Denominator: Number of residents receiving	QI9: The proportion of residents with more than four regular medication administration times[71]	The Victorian QI Program has recently developed and pilot tested this indicator in Victorian residential aged care facilities. Similar indicators (frequency of medication administration) were not found in the review of evidence. Proposed QIs are best used in combination with a QI measuring polypharmacy for additional context. In addition to measuring polypharmacy, this measure may be useful since there is emerging evidence that complex medication regimens adversely impact on resident's quality of life.

[68] Picton L, et al. Validation and implementation of three new medicines-related quality indicator measures in residential aged care facilities. Melbourne: Monash University.

[69] Montgomery A. Effect of an evidence based quality improvement framework on patient safety. Aust J Adv Nurs. 2018;35(4):6-16.

[70] Patterns of High-Dose and Long-Term Proton Pump Inhibitor Use: A Cross-Sectional Study in Six South Australian Residential Aged Care Services. Drugs Real World Outcomes. 2019;6(3):105-113

[71] Picton L, et al. Validation and implementation of three new medicines-related quality indicator measures in residential aged care facilities. Melbourne: Monash University.

Detailed findings and assessment

	Evidence review findings					Additional considerations to adapt QI for consultation	
Tier rating	**Proposed wording of QI**	**Currently used**	**What is collected**	**How is it collected**	**Calculation of reporting method**	**Source wording of QI**	**Notes (if applicable)**
				Frequency of recommended review not provided.	9 or more different medicines. Exclusions: None included.		
Tier 2	QI10: Percentage of care recipients on polypharmacy (10 or more)[72]	Not currently in use	Evidence of polypharmacy, defined as 10 or more medications in medications chart.				QI measurement concept the same as QI1.
Tier 2	QI11: Multiple quality indicators mentioned i.e. Medication appropriatenes s in the most prevalent diseases and General medication appropriatenes s[73]	Not currently in use	Not comprehensively reported. Findings from this study highlighted, in alignment with international evidence, that medication reviews and comprehensive geriatrician reviews can improve medication-related quality of care (MRQoC) in aged care. Overuse of high-risk medications was associated with falls and MRQoC activities could be better targeted towards monitoring and reducing exposure to benzodiazepines and antipsychotics. Consultations for QIs could consider supplementary monitoring of prescribing and/or utilisation rates for these medications to provide contextual information in a similar vein to QIs 5, 6 and 8 that extends beyond a focus on polypharmacy alone.				
Tier 2	QI12: No pharmacy review of medication	Australia	Part of the Queensland - The Clinical Care Indicator Tool. Not comprehensively detailed but has been trailed in Australian context through the Queensland Clinical Indicator Tool. Defined as absence of a pharmacy (medication) review, the QI looks at number of residents whose medications have not been reviewed within the last 180 days. Consideration should be given to who the review is conducted by e.g. pharmacist, nurse, general practitioner, geriatrician and should be in alignment with relevant standards and guidelines				

[72] World Health Organization. Medication safety in polypharmacy. 2019.

[73] Hillen JB, Vitry A, Caughey GE. Evaluating medication-related quality of care in residential aged care: a systematic review. Springerplus. 2015;4:220; Hillen JB, Vitry A, Caughey GE. Medication-related quality of care in residential aged care: an Australian experience. Int J Qual Health Care. 2019;31(4):298-306.

Appendix B: Tier 3 Quality Indicator measures identified in the review

Table 12: Tier 3 pressure injuries QI measures

Findings						
Tier rating	**Currently used**	**What is collected**	**How is it collected**	**Source wording**	**Source wording**	**Notes (if applicable)**
Tier 3	In use across the Australian Aged Care Sector	Process and structural indicators and compliance with key policies and controls in the sector	The extent to which these are measured and the approach varies however many are measured monthly using manual and digital audit and data collection tools (e.g. Moving On Audits Benchmarking (MOA))	Varies depending on the indicator	Varies depending on the indicator	We engaged with a number of providers across the sector as part of the review to gather information on what is currently being measured. Examples of QI measures reported from this engagement relating to preventing or treating pressure injuries and skin integrity include: 1. New skin tear with no identifiable cause 2. New skin care with identifiable cause 3. New wounds 4. Existing wounds with infections that have not healed 5. Existing wounds without infections that have not healed 6. New pressure injuries developed in the service 7. Pressure injuries on admission 8. Pressure injuries on return from hospital or other service 9. Number of residents requiring assisted transfers in 24 hours 10. Number of available transfer devices 11. Percentage of residents with skin inspection/ assessment in quarter/6 months 12. Percentage of residents with a pressure injury, with up to date care plan Please note that no one service is measuring all of these QIs. Many organisations cited guidelines, manuals and providers (MOA) as the source for development of these.

Table 13: Tier 3 physical restraint QI measures

Findings						
Tier rating	**Currently used**	**What is collected**	**How is it collected**	**Source wording**	**Source wording**	**Notes (if applicable)**
Tier 3	In use across the Australian Aged Care Sector	Process and structural indicators and compliance with key policies and controls in the sector	The extent to which these are measured and the approach varies however many are measured monthly using manual and digital audit and data collection tools (e.g. MOA)	Varies depending on the indicator	Varies depending on the indicator	The QI measure of individual environmental restraint has been identified by aged care providers as a measure of physical restraint that is currently being collected by the sector. The individual environmental restraint QI records the total number of care recipients who received any form of individual environmental restraint at least once in the audit period (typically monthly). Individual environmental restraint is described as total environmental barriers such as locked doors and gates that restrict care recipients from leaving the service freely. This includes secure units and sectioned areas with access controlled by security codes. It also includes environmental restraint such as locking a care recipient into a room or confined space. The data is collected through an audit of progress notes, restraint authorisation forms and restraint management logs. Please note that no one service is measuring all of these QIs. Many organisations cited guidelines, manuals and providers (e.g. MOA) as the source for development of these.

Table 14: Tier 3 unplanned weight loss QI measures

Findings						
Tier rating	**Currently used**	**What is collected**	**How is it collected**	**Source wording**	**Source wording**	**Notes (if applicable)**
Tier 3	In use across the Australian Aged Care Sector	Process and structural indicators and compliance with key policies and controls in the sector	The extent to which these are measured and the approach varies however many are measured monthly using manual and digital audit and data collection tools (e.g. MOA)	Varies depending on the indicator	Varies depending on the indicator	We engaged with a number of providers across the sector as part of the review to gather information on what is currently being measured. Examples of QI measures reported include: 1. Unplanned/unexpected weight loss 2. Care recipient refusal to eat 3. Number of food related complaints 4. Number of residents with recurring food related complaints 5. Percentage of new care recipients with nutritionist of GP review (within 2 weeks) 6. Percentage of new care recipients completed nutritional assessment 7. Percentage of residents not weighed in the month. Please note that no one service is measuring all of these QIs. Many organisations cited guidelines, manuals and providers (e.g. MOA) as the source for development of these.

Table 15: Tier 3 falls and fractures QI measures

Findings						
Tier rating	**Currently used**	**What is collected**	**How is it collected**	**Source wording**	**Source wording**	**Notes (if applicable)**
Tier 3	In use across the Australian Aged Care Sector	Process and structural indicators and compliance with key policies and controls in the sector	The extent to which these are measured and the approach varies however many are measured monthly using manual and digital audit and data collection tools (e.g. MOA)	Varies depending on the indicator	Varies depending on the indicator	We engaged with a number of providers across the sector as part of the review to gather information on what is currently being measured: Examples of QI measures reported include: 1. Care recipient observed falls - without injury 2. Care recipient unobserved falls - with injury 3. Care recipient unobserved falls - without injury 4. Falls resulting in ED presentation 5. Recurring falls, care recipients with 1 fall, 2 falls, 3 falls or more monthly 6. Percentage of Falls Risk Assessments completed within 24 hours of admission 7. Percentage of Fall Risk Plans completed for at risk care recipients. 8. Falls over 24 hours – time of day/night 9. Falls by location. Please note that no one service is measuring all of these QIs. Many organisations cited using guidelines manuals and provider technology/modules (e.g. MOA) as the source for development of these.

Table 16: Tier 3 medication management QI measures

Findings						
Tier rating	**Currently used**	**What is collected**	**How is it collected**	**Source wording**	**Source wording**	**Notes (if applicable)**
Tier 3	In use across the Australian Aged Care Sector	Process and structural indicators and compliance with key policies and controls in the sector	The extent to which these are measured and the approach varies however many are measured monthly using manual and digital audit and data collection tools (e.g. Moving on Audits)	Varies depending on the indicator	Varies depending on the indicator	We engaged with a number of providers across the sector as part of the review to gather information on what is currently being measured: Examples of QI measures reported include: 1. No medication review (within timeframe of 30, 60 and 90 days) 2. Medications reconciliation or review is completed within 30 days post hospital discharge Please note that no one service is measuring all of these QIs. Many organisations cited using guidelines manuals and provider technology/modules (e.g. MOA) as the source for development of these.