Core Data Set Balanced Set of Measures

This diagram shows the complete set of measures and how they are balanced around the three sides of the CCDM triangle. The measures are listed under the following headings based on research findings that support this arrangement.

1. Quality patient care = 9
2. Quality work environment = 8
3. Best use of health resources = 6

- **Patient incidents**
- **Patient experience**
- **Care rationing**
- **Staff mix**
- **Patient acuity**
- **Bed utilisation**
- **Care hours variance**
- **Shifts below target**
- **Acute staffing shortage incidents**

- **Variance indicator score**
- **Roster gaps**
- **Overtime**
- **Extra shifts**
- **Staff incidents**
- **Staff unplanned leave**
- **Staff satisfaction/engagement**
- **Professional development**

- **Casual use**
- **Total staff hours**
- **Excess accrued leave**
- **Late discharges**
- **ED Target**
- **Personnel costs**
### Programme Goal

**QUALITY PATIENT CARE**

### Measure Description

#### 1. Patient incidents

- **Rationale:** Patients are an indicator of the quality of care provided to patients, the quality of the work environment and staffing (37, 38). Lower nursing staff levels are associated with increased patient mortality (4, 5, 39), failure to rescue (6, 7, 40), medication errors (8, 9, 10), falls (10, 11) and missed care (12, 13).

- **Interpretation:** Positive/Improving.

- **Calculation:** The sum of all patient incidents reported.

- **Unit of measurement:** Number for the date period, by ward, directorate and hospital.

- **Frequency:** Monthly

- **Data Source:** DHB incident reporting system

#### 2. Patient experience

- **Rationale:** Patient experience is an indicator of the quality of care provided to patients. There is evidence that quality work environments and higher levels of registered nurses are associated with higher patient satisfaction (14, 37, 38). The is a significant association between positive nursing leadership styles, behaviours and practices and increased patient satisfaction (38).

- **Interpretation:** Trending ↑ Positive/Improving

- **Calculation:** Number of patient satisfaction surveys returned.

- **Unit of measurement:** Number for each of the four domains, by DHB

- **Frequency:** Quarterly

- **Data Source:** Health Quality Safety Commission

#### 3. Care rationing

- **Rationale:** Care rationing impacts on nurse satisfaction and causes moral distress (38).

- **Interpretation:** Trending ↑ Positive/Improving

- **Calculation:** Number for each of the four domains, by DHB

- **Unit of measurement:** Number for the date period, by shift for the ward, directorate and hospital

- **Frequency:** Quarterly

- **Data Source:** Work Analysis 'End of shift survey' or equivalent

#### 4. Staff mix

- **Rationale:** Higher levels of RNs have been associated with better patient outcomes (2). Higher RN levels are associated with lower mortality rates (31, 35, 39) and failure to rescue (5). The majority of nurse care requires RNs (2). RNs also contribute to the provision of coherent, quality nursing services through supervision, patient flow, team organisation and delegation (2). Monitoring the percentage of regulated nurses (RN, RM and EN) is a logical step towards ensuring the delivery of quality patient care.

- **Interpretation:** Trending ↑ Positive/Improving

- **Calculation:** The number of regular days (ADH, RM and EN) that worked compared with all staff that worked expressed as a percentage for AM, PM and N shift.

- **Unit of measurement:** The number of staff reporting care rationing / total number of shifts x 100.

- **Frequency:** Monthly

- **Data Source:** DHB System or DHB pay roll or human resources system

#### 5. Patient acuity

- **Rationale:** There is a strong association between patient acuity and dependency and nursing requirements (8, 10, 11, 28, 30, 31 & 32).

- **Interpretation:** Trending ↑ indicates increased patient acuity and/or volumes. Useful to chart with bed utilisation and total nursing hours or personnel costs. Review with staff mix, care hours variance and shifts below target, acute staffing shortages incidence, variance indicator scores, care rationing, patients/staff incidents, patient experience and staff satisfaction/engagement.

- **Calculation:** The sum of hours required by patient acuity (clinical hours only).

- **Unit of measurement:** Hours for the date period for the ward, directorate and hospital

- **Frequency:** Monthly

- **Data Source:** Validated Patient Acuity System
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<tr>
<th>Programme Goal</th>
<th>Measure</th>
<th>Description</th>
<th>Rationale</th>
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<tr>
<td>QUALITY PATIENT CARE</td>
<td>Bed Utilisation</td>
<td>Bed utilisation reflects the throughput of patients during a calendar day – accounting for all discharges, deceased patients, admissions and transfers for the shift on which the patient received care. By shift AM, PM, N.</td>
<td>Bed utilisation is more sensitive to nursing workload than occupancy because it counts all admissions, discharges and transfers. The process of admitting or discharging a patient requires nursing hours in addition to those hours required to care for a patient already occupying a bed. Increasing patient turnover is associated with diminishing nursing hours (26, 27) and failure to rescue (28).</td>
<td>Trending ↑ = Positive or negative (depends on starting point)</td>
<td>The total throughput of all patients on a shift divided by the ward/unit funded beds x 100</td>
<td>Percentage by AM, PM and N for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>Validated Patient Acuity System</td>
</tr>
<tr>
<td>QUALITY PATIENT CARE</td>
<td>Care hours variance</td>
<td>The difference between the hours required by acute inpatient care versus the clinical hours available to provide care by shift (AM, PM, N). This is clinical hours or direct patient care hours only.</td>
<td>This is clinical hours or direct patient care hours only.</td>
<td>Matching nursing hours with the required patient care hours is a simple strategy for minimising care rationing, ensuring workloads are fair and reasonable, and efficiently using resources. Nursing hours have a significant impact on patient morbidity, mortality (4, 7, 19) and incidents (10). Staffing levels must be set and assessed on a shift by shift basis (2).</td>
<td>Trending ↑ = Positive or negative (depends on starting point)</td>
<td>Hours required by patient acuity minus clinical hours available calculated for AM, PM and N.</td>
<td>Hours for the date period by shift for the ward, directorate and hospital.</td>
<td>Monthly</td>
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<tr>
<td>QUALITY PATIENT CARE</td>
<td>Shifts below target</td>
<td>The percentage of shifts by AM, PM, N where the difference in the care hours provided and the care hours required was greater than negative 8.5% (or 40 minutes per FTE).</td>
<td>The percentage of shifts by AM, PM, N where the difference in the care hours provided and the care hours required was greater than negative 8.5% (or 40 minutes per FTE).</td>
<td>Patient mortality increases with exposure to increased number of shifts below target (4, 10). Shifts below target is the companion measure to nursing hours variance. Nursing hours variance may be 400 hours for the month on PM shifts. However, 9 of the 30 shifts may have had negative variance of greater than 8.5% (or 40 minutes per FTE). Once 40 minutes per FTE has been breached there is increasing risk to patient safety, staff meal breaks, working overtime etc.</td>
<td>Trending ↑ = Negative/Flag</td>
<td>Count of shifts within target/total number of shifts x 100</td>
<td>Number by AM, PM and N for the ward, directorate and hospital.</td>
<td>Monthly</td>
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<tr>
<td>QUALITY PATIENT CARE</td>
<td>Acute staffing shortage incidents</td>
<td>When a nurse or midwife considers they have reached the limits of safe practice (NZNO MECA Clause 6.0). This includes, short staffing, inappropriate staff mix, reflux of patients and/or unexpected increased patient acuity.</td>
<td>Reporting of acute staffing shortages is a MECA requirement. In these circumstance emphasis is placed on professional judgement. Poor perceptions of staffing adequacy and perceived psychological strain are linked to increased patient mortality, falls, medication errors and missed care (12, 15).</td>
<td>Reporting of acute staffing shortages is a MECA requirement. This includes, short staffing, inappropriate staff mix, reflux of patients and/or unexpected increased patient acuity.</td>
<td>Trending ↑ = Negative/Flag</td>
<td>Sum of all acute staffing shortage incidents reported by staff working in inpatient wards/units.</td>
<td>Number for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
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<td>Environment Goal</td>
<td>Measure</td>
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<tr>
<td>QUALITY WORK ENVIRONMENT FOR STAFF</td>
<td>Variance indicator score</td>
<td>An early warning score alerting the hospital to a care capacity demand mismatch (surplus or deficit) in a ward/unit. There are 5 colours that indicate the ward's current state from surplus capacity (mauve) to serious shortfall in capacity (red).</td>
<td>The variance indicator scoring system is a combination of subjective and objective measures set up by the DHB. The critical factor for shift safety is RN professional judgement (42). Poor perceptions of staffing adequacy and perceived psychological strain are linked to increased patient mortality, falls, medication errors and missed care (15, 42).</td>
<td>Trending ↑ = Negative/ Flag Increasing variance indicator scores for red = orange may be caused by poor staff mix, negative care hours variance, shifts below target, increased patient acuity or bed utilisation, roster gaps and late discharges. Increasing red + orange variance indicator scores should also be viewed for impact i.e. care rationing, acute staffing shortages, patient incidents, staff incidents, patient experience and staff satisfaction/ engagement.</td>
<td>The sum of the number of times in 'red' + orange and the number of times in 'mauve' for the month, calculated separately for each by AIM, PM and N.</td>
<td>Number for the date period, by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB variance indicator system</td>
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<tr>
<td>QUALITY WORK ENVIRONMENT FOR STAFF</td>
<td>Roster Gaps</td>
<td>Roster gaps are the degree to which the posted/planned roster matches the roster model. The roster model (established from the Staffing Methodology) is the best match of FTE to demand by shift and by day of the week. The posted/planned roster is the roster that is published not less than 28 days prior to the commencement of the roster (MECA clause 6.5).</td>
<td>The roster model affords the best starting point for right staffing. The posted roster should therefore match the roster model. Having a posted roster that matches the roster model provides the best plan for having the right staffing on the day. If you start with a mismatch then you are planning to need a variance response. This is neither efficient nor effective care capacity demand management. Posted rosters that have too few or too many staff are costly.</td>
<td>Trending ↑ = Positive/ improving Trending ↓ = increasing mismatch between the posted roster and the roster model. This is commonly due to inadequate budgeted FTE, vacancy, long term sick leave or poor rostering. This means more variance response will be required every day, every shift. This is avoidable time spent by the ACNM, CNM and DNMs looking for and/or moving staff. It may also mean greater risk to patients from inadequate staffing (numbers, staff mix or skill mix).</td>
<td>Total shifts on roster model minus the total shifts on posted roster.</td>
<td>Number of shifts for the date period, by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>Roster audit or summary from DHB roster system</td>
</tr>
<tr>
<td>QUALITY WORK ENVIRONMENT FOR STAFF</td>
<td>Overtime</td>
<td>Overtime includes any extra paid hours that a nurse is required to work beyond their contracted hours at either end of their shift (2). Overtime is as defined as per the MECA. Includes payment for missed meal breaks. Example from NZNO Overtime is time worked in excess of: (i) eight hours per day or the rostered duty whichever is greater or (ii) 80 hours per two week period.</td>
<td>Overtime should be for exceptional circumstances only. Working long hours is strongly associated with adverse outcomes for nurses and increased risk of error (16, 17). Increased staff tiredness, results in loss of goodwill and paying overtime costs more money.</td>
<td>Trending ↑ = Negative/ Flag Routinely working overtime at either end of the shift indicates a shortfall in nursing care hours at the right time of the day. It may also be due to inappropriate staff mix (or skills mix). This measure is useful to interpret with care hours variance, shifts below target, late discharges, hours worked over contract, patient/staff incidents, patient experience and staff satisfaction/ engagement.</td>
<td>The sum of all hours paid as overtime.</td>
<td>Hours for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB pay roll system</td>
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<tr>
<td>QUALITY WORK ENVIRONMENT FOR STAFF</td>
<td>Extra shifts</td>
<td>All staff hours worked that are additional to their normal contracted hours of work. This applies to part time staff only. Example: a nurse may be contracted to work 24 hours per week but actually works 32 hours. Note: This differs from the NZNO definition of overtime as the nurse may not exceed 8 hours per day or 80 hours per fortnight, but is still working additional hours to contract.</td>
<td>Additional shifts worked by part time staff is an important and valuable part of the variance response management system. There is a strong positive relationship between working long hours and adverse outcomes for nurses (17). Working additional shifts may place the staff member under undue pressure to support their team in times of need and adversely affect work-life balance resulting in tiredness, reduced resilience and increased stress (2). Increased perceived psychological strain on nurses is associated with higher rates of patient mortality, falls, and medication errors (15).</td>
<td>Trending ↑ = Negative/ Flag Staff routinely undertaking extra shifts indicates a shortfall in nursing care hours on the base roster. The cause its likely to be increased bed utilisation, patient acuity, roster gaps, staff mix, care hours variance and shifts below target. The consequences may include patient/staff incidents, poor patient experience and staff dissatisfaction or disengagement. Working over contract costs more. The part time staff member accrues more annual leave and is paid at a higher average salary for annual leave. There may also be a legitimate challenge to the contracted hours when compared with custom and practice.</td>
<td>Sum all paid hours (excluding paid overtime) minus sum all contracted hours.</td>
<td>Hours for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB pay roll system</td>
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<td><strong>QUALITY WORK ENVIRONMENT FOR STAFF</strong></td>
<td>Staff incidents</td>
<td>A staff incident is any event that is reported and could have or did cause harm to a staff member (adverse event, near miss, reportable event). Examples include: accidents, needle sticks, back injuries, slips, verbal abuse etc.</td>
<td>Staff injuries cause significant individual and workplace impact. Staff incidents are more likely to occur when staff are under time pressure, tired or inexperienced or in the presence of increased workplace hazards (hours, complexity and workload) (1,3).</td>
<td>Trending ↑ = Negative/Flag</td>
<td>Sum all reported staff incidents.</td>
<td>Number for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB incident reporting system</td>
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<td><strong>QUALITY WORK ENVIRONMENT FOR STAFF</strong></td>
<td>Staff unplanned leave</td>
<td>The total unplanned or short notice leave hours taken by staff e.g. sick, domestic, bereavement, ACC. This includes sick leave hours paid, unpaid or paid as annual leave. Includes staff on permanent contracts only.</td>
<td>Sick leave is one indicator of the health of the workplace. Burnout and job stress increase staff absenteeism due to sickness (10).</td>
<td>Trending ↑ = Negative/Flag</td>
<td>Sum of hours taken for unplanned leave.</td>
<td>Hours for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>Validated Patient Acuity System or DHB pay roll system</td>
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<td><strong>QUALITY WORK ENVIRONMENT FOR STAFF</strong></td>
<td>Staff satisfaction/engagement</td>
<td>Staff experience of the work environment is measured by staff satisfaction or engagement surveys, as per the DHB staff survey process.</td>
<td>Staff satisfaction/engagement is an indicator of a healthy workplace. Engaged staff are high performing staff. Gifted staff provide better care to patients (2, 20). Evidence shows that work environments are associated with patient outcomes (11, 21). Perceptions of good organisational climate are associated with positive employee outcomes such as reduced burnout, depression and anxiety (22). Nurses reporting better staffing are less likely to report emotional exhaustion and job dissatisfaction (23). Workplace empowerment has a positive relationship to job satisfaction (24).</td>
<td>Trending ↑ = Positive/Improving.</td>
<td>Number staff stating overall satisfaction or engagement / number of staff survey responses x 100</td>
<td>Percentage for the date period, by ward, directorate and hospital.</td>
<td>Quarterly</td>
<td>Work Analysis ‘End of Shift Survey’ or DHB specific survey</td>
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<tr>
<td><strong>QUALITY WORK ENVIRONMENT FOR STAFF</strong></td>
<td>Staff professional development</td>
<td>All paid hours for staff to attend professional development activities which are additional to mandatory training and hospital training. ‘Paid leave to meet organisational and service requirements, …shall be granted in addition to provisions [for professional development leave].’ The employer will meet any associated costs (MECA clause 27.3). Includes staff working in inpatient areas only.</td>
<td>Readily available staff training and ongoing development are key aspects of a healthy workplace (1). Ongoing training and education are also fundamental to providing safe and effective patient care (2). Higher levels of education are associated with fewer falls (21) and lower mortality (38). The risk of patient adverse outcomes is lower in clinical areas with professional models of care and higher nurse skills levels (25). Attending paid professional development activities is a MECA entitlement.</td>
<td>↑ = Positive for staff and patients. May be negative for roster and personnel costs.</td>
<td>Sum of paid professional development hours.</td>
<td>Hours for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB pay roll system</td>
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<td><strong>BEST USE OF HEALTH RESOURCES</strong></td>
<td>Casual use</td>
<td>Hours paid to staff working in inpatient areas on casual contract (e.g. RN, HCA, EN) compared with total hours worked by staff on permanent contracts (e.g. RN, HCA, EN). As percentage of total hours of care.</td>
<td>Casual staff play an important role in the hospitals variance response management system. However, increasing or persistently high casual use is of concern for several reasons. Casual staff may not be familiar with the environment or have the same skill set as the staff they are replacing. Team function can be altered by high levels of casual staff. Casual labour may also directly and indirectly cost more.</td>
<td>Trending ↑ = Negative/Flag</td>
<td>Sum of all hours worked by staff on casual contract.</td>
<td>Hours and %</td>
<td>Monthly</td>
<td>Validated Patient Acuity System or DHB pay roll system</td>
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<tr>
<td>BEST USE OF HEALTH RESOURCES</td>
<td>Total staff hours</td>
<td>The total hours includes all productive (clinical and other productive hours) and non-productive (annual, sick, bereavement) hours. Includes casual staff.</td>
<td>Nursing hours have a significant impact on patient outcomes such as morbidity, mortality (4, 7, 39) and incidents (18).</td>
<td>Trending ↑ = Positive or negative (depends on cause and source of increase e.g. productive or non-productive) The total nursing hours is useful in comparison to nursing personnel costs, bed utilisation, patient acuity, professional developed and accrued annual leave. Significant increases/ decreases from one month to another require further investigation of the cause e.g. an increase in patient one to one care.</td>
<td>Total annual leave balance - (annual entitlement x 2 x FTE)</td>
<td>Hours for the date period by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB pay roll or human resource system</td>
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<tr>
<td>BEST USE OF HEALTH RESOURCES</td>
<td>Excess accrued leave</td>
<td>Excess accrued leave is an annual leave balance in excess of 24 months worth of the current annual entitlement (MECA, clause 13.4). A healthy work environment has the health and wellbeing of the person as its primary objective (1). Annual leave entitlements exist to support staff take adequate breaks from work. Excess annual leave indicates staff are not taking or unable to take their annual leave. Excess annual leave is a financial liability for the DHB.</td>
<td>Excess annual leave accrual may be due to insufficient budgeted FTE, roster gaps (vacancy, long term sick leave) i.e. the posted roster does not match the roster model. The impact of excess accrued leave can be seen in total nursing hours personnel costs. Excess accrued leave may also impact on staff tiredness, satisfaction and engagement.</td>
<td>Trending ↑ = Negative/ Flag Excess annual leave accrual may be due to insufficient budgeted FTE, roster gaps (vacancy, long term sick leave) i.e. the posted roster does not match the roster model. The impact of excess accrued leave can be seen in total nursing hours personnel costs. Excess accrued leave may also impact on staff tiredness, satisfaction and engagement.</td>
<td>Total annual leave balance - (annual entitlement x 2 x FTE)</td>
<td>Hours for the date period, by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>Patient Management System or Validated Patient Acuity System</td>
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<tr>
<td>BEST USE OF HEALTH RESOURCES</td>
<td>Late discharges</td>
<td>The DHB sets discharge time for inpatient areas. Late discharges are therefore after the pre-set time. E.g. Patients discharged after 11am on their expected date of discharge. A healthy work environment has the health and wellbeing of the person as its primary objective (1). Annual leave entitlements exist to support staff take adequate breaks from work. Excess annual leave indicates staff are not taking or unable to take their annual leave. Excess annual leave is a financial liability for the DHB.</td>
<td>A healthy work environment has the health and wellbeing of the person as its primary objective (1). Annual leave entitlements exist to support staff take adequate breaks from work. Excess annual leave indicates staff are not taking or unable to take their annual leave. Excess annual leave is a financial liability for the DHB.</td>
<td>Trending ↑ = Negative/ Flag Late discharges may be caused by staff mix, care hours variance or shift below target. Late discharges may falsely elevate the care hours required resulting in &quot;surplus&quot; once the patient leaves. Late discharges impact on the ED target and operating theatre.</td>
<td>Sum of patients discharged late on their expected date of discharge / total number of patients discharged that day x 100</td>
<td>Percentage</td>
<td>Monthly</td>
<td>Patient Management System or Validated Patient Acuity System</td>
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<tr>
<td>BEST USE OF HEALTH RESOURCES</td>
<td>ED length of stay</td>
<td>The ED Length of Stay Target is the 'Shorter Stays in Emergency Department (ED)' i.e. Patients admitted, discharged, or transferred from the ED within six hours. The target is 95%. Can only be reported by specialty e.g. general surgery, gynaecology.</td>
<td>This is a national DHB performance measure. The target is a measure of the efficiency of flow of acute (urgent) patients through public hospitals, and home again.</td>
<td>Trending ↑ = Positive/ improving Where ED target is not being met, review against late discharges, bed utilisation, staff mix, care use, car hours variance and shifts below target.</td>
<td>Sum of patients admitted, discharged, or transferred from ED within six hours / total number patients seen x 100</td>
<td>Percentage for the date period by specialty and hospital.</td>
<td>Monthly</td>
<td>DHB reporting system</td>
</tr>
<tr>
<td>BEST USE OF HEALTH RESOURCES</td>
<td>Personnel costs</td>
<td>The dollar amount spent per month on personnel costs (e.g. nursing, allied health, midwifery, HCA). Includes personnel costs for casual staff.</td>
<td>Nursing is the largest workforce and therefore one of the biggest investments in providing healthcare services. DHBs are responsible for best value for public health system resources. A logical step in achieving this is to monitor and report on personnel costs. Some studies suggest higher staff costs are off set by better patient or system outcomes (4, 7). Higher staffing levels are associated with lower hospital use in terms of length of stay (30, 32, 33) and re-admission (34).</td>
<td>Trending ↑ = Negative/Flag if not justifiable. Personnel costs are best interpreted with a number of other measures including unplanned leave, professional development, annual leave accrual, bed utilisation, patient acuity, professional, staff mix, casual use, hours worked over contract and overtime.</td>
<td>Sum of all dollars paid to staff</td>
<td>Dollars for the date period, by ward, directorate and hospital.</td>
<td>Monthly</td>
<td>DHB pay roll system</td>
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</table>
Interpreting the Core Data Set

The following flow chart assists with interpreting the core data set. By working through 'if this, then check' each of the measures can be reviewed against the others. The flow chart can be read from left to right, or right to left, or you can start in the middle and work out. The arrow at the bottom shows the flow of 'may be caused by' and 'likely impact' from right to left.

If this, then check...

- Staff unplanned leave
- Patient acuity
- Bed utilisation
- Roster gaps

If this, then check...

- Staff mix
- Care hours variance
- Shifts below target

If this, then check...

- Acute staffing shortage
- Incidents
- Variance indicator score
- Care rationing

If this, then check...

- Casual use
- Overtime
- Extra shifts

If this, then check...

- Staff professional development

If this, then check...

- Excess accrued leave

May be caused by

Late discharges

ED length of stay

 Likely impact

- Patient incidents
- Patient experience
- Staff incidents
- Staff satisfaction/engagement

- Total staff hours

- Personnel costs
References


20. Point of Care Foundation (2014). Staff Care - How to engage staff in the NHS and why is matters. Point of Care Foundation.


