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The Kettering Infection Predictor Tool

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Summary of project

Following increases of healthcare associated infections (HCAIs), the Infection Control Team, in conjunction with the Director of Nursing, set about developing a tool which would identify patients at an increased risk of acquiring an infection rather than waiting until the patient had become infected. The tool was designed to prompt staff to implement additional precautions including the review of antibiotics, use of integrated care pathways for MRSA/C. Difficile, care plans for invasive devices and the need for isolation and additional cleaning.

The tool was designed to be simple and quick to use. Patients are categorised using a traffic light system which is easy for all staff to see on the wards and is a useful format for monitoring purposes. The tool was piloted on both medical and surgical wards and the rates of HCAIs were monitored.

The project demonstrated a significant reduction in the rates of HCAIs in the areas which used the Kettering Infection Predictor (KIP) tool compared with those areas which did not use it.

The pilot study has now been completed and a roll out programme developed for the Trust.

Background

The Department of Health (2006) identify that HCAIs cost the health service around one billion pounds per year and patients who get a HCAI are subject to increased anxiety, pain and suffering. By reducing HCAIs we enhance service efficiency, benefit the workforce by reducing workload, improve patient experience and clinical outcomes and in addition to this reduce the overall cost to the Trust.

In 2005-2006, Kettering General Hospital NHS Trust was experiencing a high incidence of HCAIs. Infection rates for both the C. Difficile toxin (Health Protection Agency, 2007) and MRSA bacteraemia as set by the East Midlands Strategic Health Authority were unacceptably high. As the Trust had limited isolation facilities available, there was a need to prioritise patients at a high risk of getting an HCAI. The predictor tool was created to assess the most suitable patients to be transferred to the isolation ward or into a side room on the wards and enable staff to identify those patients that needed to be either started on a care pathway or required extra domestic cleaning around their bed space.

Aim of the project

To develop a risk assessment tool in order to predict which patients are at an increased risk of acquiring a HCAI whilst in the hospital environment.

Developing the Kettering Infection Predictor (KIP) tool

The Infection Control Team looked at the assessment tools already in use in the hospital to ascertain if they could be used with reference to the development of the KIP tool. The following tools were used to inform its development: the Malnutrition Universal Screening Tool (MUST), the Kettering Early Warning Score (KEWS), which is a tool to identify patients at risk of becoming critically ill and the Waterlow Scoring Tool used to assess tissue viability.

Using evidence-based research (Going Further Faster, Department of Health, 2006; Saving Lives High Impact Interventions, Department of Health, 2007), other risk factors were also taken into consideration to create a predictor tool that included the following criteria to calculate a patient's risk of acquiring an infection:

- Age of patient

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- Exposure to antibiotics
- Previous hospital admissions
- Invasive devices/ implants
- Where patients were admitted from
- Extra criteria including any underlying medical conditions, any previous infections, being a healthcare worker, wounds (acute e.g. surgical or chronic e.g. pressure sores/leg ulcers) and immuno-compromised/suppressed

Each of the above criteria was given a score and patients were then assessed using a traffic light scoring system:

0 - 10	At Risk	GREEN
10-20	High Risk	AMBER
20+	Very High Risk	RED

The KIP tool was then designed, colour printed and laminated to enable it to meet the Trust's requirements for cleanliness. In addition, a separate evaluation-scoring sheet was designed, to be used in conjunction with the KIP tool for keeping a record of the patient's current status.

Using the tool

Following assessment, those patients who fell into the GREEN category were given a patient and visitor information booklet on reducing the risk of infection whilst in hospital. This booklet was devised by the Infection Control Team and included advice on Hand Hygiene, General Hygiene, Personal Belongings, Visitor's Guidelines and Food Hygiene.

The KIP tool prompted staff to start patients on the appropriate care pathway if necessary e.g. MRSA, C. Difficile, with a referral to the Dietician, Tissue Viability Nurse or Physiotherapist for additional support if required.

Patients with invasive devices were started on an appropriate care plan to ensure that management was documented e.g. catheter care plan and cannula care plan.

Patients in the AMBER category were to receive the same interventions as the GREEN category of patients, with the addition of increased cleaning around the bed space (staff were asked to arrange more cleaning with their ward based cleaners). Antibiotic usage was to be closely monitored and the use of alternative products for invasive devices such as silver impregnated lines/CVP, coated catheters were to be considered. The patients were to be given additional discharge information on the management of invasive devices and any decolonisation treatment which needed to be continued at home.

Those in the very high risk RED category were to receive all of the above and be isolated into a single room using protective isolation methods. Staff were prompted to use single use equipment e.g. blood pressure cuffs and to ensure that the visiting policy was strictly adhered to. In addition to this prophylactic general measures were

implemented, including increased cleaning, skin decolonisation and the use of the IQ air filtration machine. Finally the staff were asked to closely monitor antibiotic usage so it was consistent with the Trust's antibiotic guidelines and ensure advice was sought from the Consultant Microbiologists.

Piloting the tool – Phase One

The KIP tool was launched as a Pilot Study on August 1st 2007 in two hospital areas: a medical ward, Harrowden A (HAW) and a surgical ward, Deene C (DCW). The pilot ran for one month.

HAW piloted the tool in two bays each having five beds, giving a total of ten medical beds. DCW piloted the tool in three bays each having four beds and three single side-rooms, giving a total of fifteen surgical beds. During the pilot period, the KIP tool was to be completed for all patients in these beds.

Four teaching sessions were arranged and undertaken by the Infection Control Team. The teaching sessions on HAW included the Ward Managers and the Registered Nurses who were working in the bays where KIP was to be used, this totalled 8 members of staff over the 2 sessions and on DCW it included the Ward Managers, Registered Nurses and Healthcare Assistants, a total of 15 staff over the 2 sessions.

An information board was designed explaining the KIP tool to ward staff, patients and their visitors, which was clearly visible when entering the ward.

Each patient's nursing folder contained a laminated KIP tool and a non- laminated scoring and evaluation sheet. This was to be completed on admission and if and when the patient's condition changed. On discharge the results were filed in the patient's notes, so that in the future people could see risk assessments were carried out on the patients whilst in hospital and any appropriate actions that were taken.

A member of the Infection Control Team was the designated co-ordinator and visited both wards on a weekly basis or more regularly as required to support the staff, gather feedback and monitor progress.

Two nurses on each ward volunteered to act as link nurses to liaise with the co-ordinator and give feedback.

Phase One outcomes

During the pilot phase, HAW completed 10 KIP assessments and DCW completed 45 KIP assessments.

After reviewing the completed KIP forms and talking to the staff on both wards, it was felt that a time frame should be indicated on the KIP form as to how often the patient's infection risk status should be monitored and reviewed.

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What became apparent on the surgical ward was that the patient's risk dramatically changed post-operatively from GREEN status to AMBER, and sometimes even to RED, and extra precautions and care were highlighted to the staff and cleaners. After 48 hours the patient's status would quickly return from RED to AMBER to GREEN thus showing that regular reviews were necessary. It was felt that surgical patients should be assessed pre-operatively (to ascertain a baseline), day one post-operatively, day three post-operatively and then every 72 hours until discharge or more regularly if the patient's condition changed.

On the medical ward, following discussions with the staff, it was decided that the review should take place at least every 72 hours or more regularly if the patient's condition deteriorated. In addition it was decided to use the existing KEWS score as an evaluation of frequency.

KEWS score 0	re-asses every 72 hrs
KEWS score 1-3	re-assess every 48 hrs
KEWS score 4+	re-assess every 24 hrs

A new evaluation sheet was designed to prompt regular reviews.

It was also felt that a visual prompt or symbol should be used to identify those patients at high risk. After discussion with the ward managers, it was decided to produce laminated orange and red hand signs that could be placed above the patients' bed to inform other healthcare workers if a patient was at a higher risk and to encourage good hand hygiene and extra cleaning around the bed space.

Piloting the tool – Phase Two

Following the initial pilot, the tool was revised and adjusted using the comments made by the staff who had been using it. For this reason a second phase was launched to test these amendments and the impact of the new at risk hand signs.

Unfortunately, due to unforeseen circumstances on the medical ward HAW, it was necessary to re-pilot the KIP tool (in Phase 2) on another medical ward. Naseby A (NAW) was chosen as this also had a sister ward Naseby B (NBW) which could be used as a control group, both being twenty bedded open wards with a previous history of high infection rates.

Two teaching sessions on NAW were arranged and undertaken on 9th January 2008, one in the morning for the early shift and another in the afternoon for the late shift. Two link nurses were designated to assist with the monitoring and feedback of the KIP tool to the infection control co-ordinator.

An information board for patients and visitors was put up at the entrance of the ward.

DCW also undertook teaching sessions on 16th January 2008 because although they had piloted the KIP tool before, the new changes needed to be explained. The link nurses remained the same as in Phase One.

Phase 2 of the KIP tool pilot study was re-launched on 21st January 2008 until 21st March 2008. NAW (medical) and DCW (surgical) both participated for the two-month period. During this time, DCW completed 85 KIP assessments and NAW completed 38 KIP assessments.

On the surgical ward patients were reviewed and rescored:

1. Pre-op
2. Day 1 Post-op
3. Day 3 post-op
4. Then every 72 hours

Medical patients were reviewed and rescored depending on their KEWS score as outlined above.

Phase Two outcomes

After reading through the completed forms and talking to the staff on both wards, KIP was evaluated as a very useful tool. Through observation and discussion the nurses felt that KIP had clearly highlighted those patients at risk of infection and made other members of staff, cleaners and visitors aware of good hand hygiene and of taking extra precautions.

Patients, who fell into the RED category, were able to be isolated as a priority either into a side-room or onto the isolation ward.

Both wards found the assessment tool easy to understand and complete. It was reported, by the staff, both verbally and in a question and answer session to be user friendly and not as time consuming as originally anticipated by some staff members.

The surgical ward was generally able to complete the forms and review the patient as requested i.e. pre-op, day one post-op, day three post-op and then every 72 hours, by which time most surgical patients were discharged. For long stay patients this was often reviewed on a weekly basis until discharge or more often if the patient's condition deteriorated.

The medical ward tried to reassess every 72 hours or every 24 hours on those patients with a KEWS score of 4+ but found this difficult. The KIP tool link nurses suggested that this be incorporated into the ward daybook to highlight those at very high risk by a red dot to remind staff to do these first.

Both wards felt that although the laminated score sheet was good there was no way of knowing how the score was achieved on the un-laminated evaluation sheet. Each

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time the score needed reviewing they had to look back through the notes to see if they had been in hospital before, where they came from and when they last had antibiotics. A new evaluation sheet was therefore designed with a tick box score sheet on one side and an evaluation sheet of care given on the other side. Both wards reported that this was very helpful indeed, not only in saving time but also maintaining continuity, and reducing the paperwork needed

Comparison studies

After a successful Phase Two, the Infection Control Team compared patients on NAW admitted during the two-month trial period using the KIP tool against patients on NBW admitted during the same time period but without using the KIP tool.

It was found that patients on NBW (without the KIP tool) had a HCAI rate of 22.8% whilst NAW (with the KIP tool) had a significantly lower HCAI rate of just 6.25%.

Another comparison study was undertaken to see if these figures could be repeated.

Patients on NAW with the KIP tool were compared against patients admitted to NAW exactly one year ago January 21st – March 21st 2007 without the KIP tool. The results showed that NAW (2008 with the KIP tool) had a HCAI rate of 6.25% compared to NAW (2007 without the KIP tool) which had a HCAI rate of 21.9%.

Conclusion

It was felt that the development and successful implementation of the KIP tool had significantly reduced and kept infections to a minimum with the continuous prompting of good hand hygiene, extra cleaning around the bed space and bay, the use of personal protective equipment i.e. gloves, aprons and masks combined with the newly acquired ability and knowledge to prioritise patients needing to be isolated quickly.

Staff found the evaluation sheets easy to fill out, user friendly, not time consuming and easy to understand. Both wards are continuing to use the assessment tool even after the trial period has ended because it has made a significant reduction to their infection rates and the raised awareness amongst the multi-disciplinary staff groups working on the wards, from domestics, physiotherapists, phlebotomists, porters, nurses and doctors.

The Infection Control Team are presenting their findings at the Nursing and Midwifery Advisory Council (NMAC) and hope to roll out the assessment tool across the Trust over the next few months following ward training, to including a ward training package.

References

Department of Health (2006) *Going Further Faster: Implementing the Saving Lives Delivery Programme, Sustainable Change for Cleaner, Safer Care*. London: HMSO.
Health Protection Agency (2007) cited from: http://www.hpa.org.uk/infections/topics_az/hai/C_diff_Annual_Jan_2007.xls

Further information

A full project report, including copies of the KIP tool and associated documentation can be downloaded from: <http://www.fons.org/ahcp/projects2007/predictinginfections.asp>

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