AQuA
Advancing Quality Alliance

NHS
Health Education England

Patient Pathway and System Solutions on Sepsis

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Introduction

Patient Pathway and System Solutions on Sepsis consists of thirteen case studies to support healthcare staff with real examples of best practice in the early detection and treatment of patients with sepsis.

The case studies have been created as part of HEE's THINK SEPSIS programme, which aims to improve the diagnosis and management of those with sepsis; they have been split into the following areas; primary care, secondary care, diagnostics and cross-sectional sepsis work.

Patient Pathway and Systems Solutions on Sepsis were developed by AQuA's Advancing Quality Team in partnership with Health Education England.

Suspicion of sepsis and deterioration in Care Homes

Residents living in care homes represent one of the highest risk groups for sepsis; they are elderly, often living with co-morbidities, are immune compromised and at an increased risk of infection which can lead to sepsis.

Lancashire County Council worked with local Clinical Commissioning Groups to deliver an improvement programme aimed at the early identification and escalation of patients in care homes with a suspected diagnosis of sepsis.

Action One: Understand local drivers for improvement

The Lancashire County Council's Infection Prevention Team identified a gap in service delivery in the early identification and timely referral to treatment for care some residents with sepsis. Informed with the local drivers in the region the Infection Prevention Team devised the Sepsis Strategy.

Action Two: Training Programme

A cross-organisational team including Lancashire County Council's Infection Prevention Team, local Sepsis Specialist Nurses and a Care Home Manager, designed and delivered training sessions to senior care home staff. These training and development sessions aimed to improve the knowledge, confidence and skills of care home staff in the early identification of sepsis.

Action Three: Escalation

As part of the programme of education Care Home Teams were also provided with details of pathways for escalation of a deteriorating patient.

Read the full case study here

Early assessment in out of hours primary care

Sepsis and deterioration are huge clinical problems and 70% of sepsis cases originate in Primary Care. In the last five years we have experienced a culture shift in primary care; from seeing sepsis as an acute condition that is difficult to detect, to recognising the need to actively assess patients where infection could be causing significant illness or deterioration..

While the adoption of NEWS2 criteria has enabled secondary care and ambulance services to standardise assessment and communication, there remains a lack of evidence for the best methods of assessment for primary care settings. This work led by Primary Care:24 aims to implement standardised messages to communicate concerns of potential sepsis cases to patients, General Practice, Hospital and ambulance services.

Action One: Establish an Improvement Team

Primary Care:24 brought together staff from the local Sepsis ED team at the Royal Liverpool and Broadgreen University Hospital NHS Trust, and three doctors from the out of hours service to design and implement a programme of improvement.

Action Two: Increasing education and awareness

In October 2016, the Improvement Team used a patient case study for an education and awareness session at the Primary Care:24 centre with attendees from across the out of hours service including North West Ambulance Service.

The education programme continued; information and learning have been shared from the sepsis collaborative, relevant call analysis, audit and Datix incidents and complaints.

Continued over...

Early assessment in out of hours primary care (continued)

Action Three: Using data to improve

The Improvement Team collated baseline data in August 2016, this looked at the number of patients with full, partial or no observations. Results captured encouraged Primary Care: 24 to change the electronic system so a full set of observations had to be recorded before completing calls for patients admitted to hospital with infection.

Action Four: Collaborative working

The team benefitted from the advice, support and learning from other regional organisations as part of the system-wide sepsis improvement programme.

Results

The programme aimed for 75% of adult patients admitted to hospital from primary care with suspected sepsis to have a full set of documented observations and this was met by month 12 of the programme. Performance has been sustained over the last 12 months and continues to be monitored to ensure embedding within the organisation.

Read the full case study here

Reducing the risk of deterioration in the community

More than seven out of ten people with sepsis develop the condition outside of hospital, strategies for early detection should consider timely care in the community. Pennine Acute Trust Community Services have developed a mechanism for early identification of sepsis in the community setting.

Action One: Establish an Improvement Team

The Trust brought together staff from Heywood, Middleton and Rochdale Community Services and North Manchester community services, including nurses and physiotherapists from a variety of teams.

The digital learning team later joined the group when it became clear that an e-learning programme was needed to increase staff's knowledge.

Action Two: Community sepsis screening tool

The Improvement Team identified the need for an early diagnosis screening tool specifically for use in the community. To develop the tool the team used Plan, Study, Do, Act (PDSA) cycles to ensure that the tool included relevant parameters and was easy to use for all staff.

Action Three: Education

The improvement Team designed an education programme to accompany the launch of the community adult observation NEWS2 and sepsis screening tool. The Digital Learning Team developed an eLearning programme, it was designed for all capabilities.

Continued over...

Reducing the risk of deterioration in the community (continued)

Action Four: Process improvement

The Improvement Team carried out a process review and identified delays in the treatment of suspicion of sepsis. One of the common delays was the availability and location of relevant equipment. A sepsis trolley was introduced, with the right equipment stored in a central location.

Action Five: Community sepsis information card

A Community sepsis information card was developed as a prompt to staff to 'Think Sepsis' at any point of care where 'deterioration' in physiological wellbeing is indicated.

Results

Evaluation is ongoing but teams have reported that the common language is being utilised and there are improved communications between health care professionals.

More than seven out of ten people with sepsis develop the condition outside of hospital

Read the full case study here

Standardising the assessment and escalation of patients with sepsis

Pennine Acute Trust Community Services identified the need to standardise the assessment and escalation of patients with suspected sepsis across their constituent healthcare organisations in the community.

Pennine Acute Trust Community Services implemented the National Early Warning Score: 2 (NEWS2) across their community services using a screening tool and providing education and support to staff.

Early warning scores support communication between all health care providers, enhancing and focusing the handover of technical information about patients, especially those at risk of deterioration.

Action One: Introduce early warning scores

An Improvement team was established, the team coordinated a programme of improvement to support the standardisation of assessment and escalation using a Quality Improvement approach.

The team developed a community sepsis screening tool based on the community adult observation NEWS2. The Improvement Team designed an education programme to support the new tool, developed by the Digital Learning Team.

Action Two: Creating a culture of continuous improvement

The Improvement Team identified several opportunities to improve the management of deteriorating patients. The trust decided to implement the use of Situation, Background, Assessment and Recommendation tool for each patient with a suspicion of sepsis and have incorporated training in the use of approach into the training programme for the NEWS2 screening tool.

Results

Local feedback from community teams consistently indicates that the use of the protocols and tools have increased staff confidence in identifying deteriorating patients and provided clarity on when to escalate. The team also report a reduced wait time for ambulances; this has yet to be verified from the data collected.

Read the full case study here

Improving the diagnosis and treatment of sepsis

St Helens and Knowsley Teaching Hospitals established a team of sepsis nurse specialists to deliver a 24 hour service to identify diagnose and treat patients with sepsis. The introduction of a specialist team has supported the work of the trust to increase the proportions of patients being screened for sepsis, the timely treatment of patients and reduced hospital mortality and the readmission rate for people with sepsis.

Action One: Establish a Sepsis Team

In 2016 the trust established a Sepsis Team to deliver a 24 hour service to:

- Clinically review patients with suspected sepsis identified through screening
- Assist in the completion of the sepsis six management, including antibiotic administration
- Review patients with red flag sepsis in ED
- Follow up admitted patients to provide support and education

Action Two: Centralise and standardise processes

The Sepsis Team have developed a systematic approach to identify and treat patients diagnosed with sepsis including:

- Training for trust staff to ensure that screening is completed for all patients
- Information leaflets for patients
- Education file for each ward to ensure access to relevant materials and record staff training

Action Three: Establish mechanisms for improvement

The team worked to establish ways to capture learning so that the trust could identify opportunities to improve the diagnosis and treatment of people with sepsis. The key mechanism to do this was to undertake reviews of all sepsis patients to identify whether appropriate management plans were in place.

Since March 2018 the trust has consistently screened 9 out of 10 patients in the emergency department

Continued over...

Improving the diagnosis and treatment of sepsis (continued)

Action Four: Spread and sustain improvement

The trust has developed a robust training package which consists of tiers of training to meet the needs of all staff groups. The team can support a more bespoke approach to education and staff have been offered opportunities to engage including; sepsis study days, bespoke training to wards, e-learning training and FY1 training.

Action Five: Cross-organisational working

Analysis of data and the review of sepsis cases indicated that opportunities for early diagnosis could be missed prior to the patient arrival at the trust. The team ran sepsis awareness training and engaged with local services including GP surgeries and ambulance services.

Results

- Since March 2018 the trust has consistently screened 9 out of 10 patients in the emergency department
- Performance also improved for the proportion of all admitted patients who were screened for sepsis. The most recent data show the trust is currently above the 90% target at 94.5%
- In September 2018, 98.5% of patients reviewed by the sepsis team, were treated for suspected sepsis and received antibiotics within one hour of diagnosis

Read the full case study here

Sepsis awareness to improve patient outcomes

Early recognition of sepsis by ward nurses has been shown to improve survival for patients in hospital. Mid Cheshire Hospitals NHS Foundation Trust (MCHFT) wanted to improve recognition of sepsis across the organisation, ensuring that early recognition and treatment promoted optimal outcomes and experience for patients.

Action One: Implementing a Sepsis Pathway

The Sepsis Pathway was devised, and feedback was sought from all disciplines in the healthcare team, this ensured the proposed pathway was suitable to be implemented across the differing health care settings.

Action Two: Raising awareness of sepsis

Raising awareness was one of the key organisational improvement aims. Sepsis Screening stickers were developed to act as a visual prompt for staff responsible for admitting patients. In addition, the Sepsis Nurse has hosted and promoted sepsis awareness and education events.

Action Three: Education

The Sepsis Team have assumed responsibility for the overall programme of education within the organisation and have co-ordinated various initiatives to ensure sepsis remains a priority, including:

- Sepsis Focus Weeks
- Sepsis Link Nurses
- E-learning training
- Quality Week

Continued over...

Sepsis awareness to improve patient outcomes (continued)

Action Four: Development and implementation of improvement initiatives

Many improvement initiatives have been developed and embedded with the organisations to Support the team in the delivery of sepsis care.

- Sepsis trolley: all the equipment for diagnosis and treatments are available in a central location
- Patient Group Direction (PGD): for patients diagnosed with high risk sepsis and is used in both the emergency department and ambulatory care unit
- Sepsis steering group: to review screening, treatment time and understand the mortality related to this condition
- Sepsis pathway and trigger system in the community: pre-alerting of patients suspected of having sepsis to acute care teams

Early recognition of sepsis by ward nurses has been shown to improve survival for patients in hospital.

Results

The rate of sepsis screening for hospital arrivals has improved by 18 per cent. There has also been a 24 per cent increase in the number of patients receiving antibiotics within one hour of sepsis diagnosis.

The number of patients with sepsis diagnosis has increased whilst the in hospital mortality has fallen.

Read the full case study here

Improving the treatment of sepsis and reducing variation

Recognising there was considerable variation in performance for the AQ sepsis measure set across Pennine hospital sites, the trust wanted to improve consistency in diagnosis and treatment of patients presenting with suspected sepsis. The National recommendation to transition to using the NEWS2 assessment criteria gave the organisation the opportunity to review current practice to ensure early recognition and escalation of the deteriorating patient was paramount in admission areas.

Action One: Identifying resource

The trust established a Sepsis Improvement Team. The team was established to identify and carry out work to improve the overall standards of care for patients diagnosed with sepsis.

Action Two: Leadership

Each clinical site was asked to designate a clinical lead to drive improvement programmes, responsible for overseeing the delivery of hospital site level improvements.

Action Three: The use of data

The sepsis improvement team used the AQ Sepsis measure sets and reports to identify two key areas for improvement:

- the number of patients' early warning score recorded within 60 minutes
- the number of patients who were administered antibiotics within the first hour of sepsis diagnosis

Action Four: Plan, Do, Study, Act

Each Emergency Department in the trust group adopted processes and systems to meet the requirements of their patient groups. Introducing new processes ensures that appropriate actions are taken.

Continued over...

Improving the treatment of sepsis and reducing variation (continued)

Action Five: Adopt best practice

Pennine Acute Trust has successfully introduced NEWS2 in all sites to ensure that assessment of each patient is standardised. The trust has implemented the 'Start Smart Then Focus' policy to ensure the appropriate use and treatment times for antibiotics therapy.

Action Six: Use digital technology

To ensure assessment consistency and improve the proportion of patients having an early warning score recorded within 60 minutes of hospital arrival, the team identified digital process improvements.

Action Seven: Continuous improvement

The trust implemented a variety of formal and informal training and support for all staff.

Results

The trust has improved performance for the proportion of patients having a recorded early warning score within 60 minutes of hospital arrival to over 90 per cent. The proportion of patients receiving antibiotics within one hour of sepsis diagnosis has improved from 73.7% to 80%.

Read the full case study here

Implementation of a sepsis care pathway to improve outcomes

The 2013 'Time to Act' report focused on ten patients with severe sepsis who did not receive the urgent treatment they needed. There were striking differences observed in guidelines and practice between hospitals.

Advancing Quality (AQ) is a long-running North West England programme offering a structured approach to embedding evidence-based care. AQ identified the opportunity to work with participating organisations to support the development and implementation of standardised care pathways as recommended in the Time to Act report.

Action One: Facilitate the development of a North West Sepsis Care Bundle

After the publication of the 'Time to Act' report the Advancing Quality Sepsis Clinical Excellence Group (CEG) met to prioritise and recommend key focus areas for the Sepsis Care Bundle.

Action Two: Facilitate the implementation of a North West Sepsis Care Bundle

The Advancing Quality group provide participating organisations with two collaborative events on sepsis each year. The collaborative events aim to share best practice, innovation, implementation, improvement and outcomes.

Action Three: Measure the roll out and impact

The CEG requested that Advancing Quality include an additional measure for trusts to capture whether a care pathway was followed for each patient diagnosed with sepsis. The level of compliance could then be reported on a monthly basis.

Results

By November 2018, all the participating health care organisations had used the results of the CEG review to successfully implement the Sepsis Care Bundle. The number of patients with sepsis on a care pathway increased from just 35% in April 2018 to 71% in November 2018.

Overall 16 organisations attended the Sepsis collaborative events in 2018 with many organisations sharing their story of implementation through formal presentation and networking opportunities.

Read the full case study here

Reducing avoidable harm through patient assessment and escalation

The Walton Centre NHS Foundation Trust wanted to improve observation recording, recognition and response to deteriorating patients using the NEWS assessment tool.

The Walton Centre use a Track and Trigger system or Early Warning Score to detect deterioration in patient well-being. If a patient's score indicates they may be deteriorating or nursing staff are concerned, patients will be referred to the Surgical and Medical Acute Response Team (SMART). If after review, a higher level of care is required, the patient is transferred to the appropriate area, for more specialised treatment or monitoring.

In July 2018, it was found that of the 16,382 patients seen, there were almost 1,000 (6%) for whom no observation score was recorded. Only 4 in 10 patients who did receive a score were compliant with standards.

Action One: Develop observation recording system

The improvement team developed an integrated system that would allow real time review of observation recording in each clinical area. This was designed to be available to the SMART team to provide an overview of each patient's observational recordings, and allow for early recognition of deterioration.

Action Two: Educate and engage staff

Formal and informal education was delivered to staff by the SMART team. Bespoke support and coaching was available for clinical team's staff; designed to empower staff to have the confidence to escalate appropriately. Staff were provided training in the use of NEWS recording and SBAR (Situation, Background, Assessment, Recommendation) tool.

Continued over...

Reducing avoidable harm through patient assessment and escalation (continued)

Action Three: Use data to influence change

Continuous analysis of observations recorded were used to support staff, understand variation in care delivery and prioritise and evaluate the education programme.

Action Four: Staff scoping

The SMART team engaged in discussions with all clinical staff and implemented interventions to improve the compliance of recording observations.

Results

The Track and Trigger system demonstrated an increase in compliance for recorded observations. From July 2018 to March 2019, compliance to NEWS increased by 25%.

The number of referrals has reduced from 297 to 170 and number of bleeps has fallen from 1,421 to 1,268. This may be as a result of the interventions implemented that staff now feel confident in managing patients appropriately, escalating only when needed.

Read the full case study here

Serum lactate in the treatment of sepsis

The Royal Liverpool & Broadgreen University Hospitals NHS Trust (RLBUHT) identified an opportunity to improve the early diagnosis of patients with sepsis. Evidence suggests that the sickest sepsis patients have high levels of serum lactate. Timely measurement of serum lactate levels in patient pathways can improve early diagnosis which will lead to improved outcomes. RLBUHT have successfully implemented a process to capture serum lactate measurement and flag high risk patients.

Action One: Introduced lactate sensors to all ABG machines.

Action Two: Provided shared vision for improvements to all staff alongside education on serum lactate testing.

Action Three: Routinely monitored the timelines and prevalence of lactate testing to ensure it is embedded into everyday patient monitoring.

Results
- Improved serum lactate sampling since the introduction of the Advancing Quality system.
- Prompt identification of the sickest patients to clinicians.

Read the full case study here

Improving early detection and treatment of sepsis

The early detection and treatment of sepsis has been highlighted as a major focus for improvement, NHS England produced a National Action Plan and a financial incentive system.

Advancing Quality (AQ) is a North West programme designed to identify and reduce unwarranted variation in the delivery of care across healthcare organisations. The lack of available and comparable data for sepsis has hampered evaluation; the AQ Sepsis programme offers a clinical, defined measure set to support organisations to improve. The measures are designed to provide a consistent approach to early identification and treatment and reflect national policy and the best available evidence.

Action One: Provide and promote the measure set

To provide and promote a standardised measure set, the AQ programme used diagnosis data from hospitals to identify admissions relating to sepsis. Hospital trusts then enter the additional measure set data required for these admissions from patient notes.

Action Two: Reporting

The AQ team manage the data processing and produce monthly reports for participating trusts; focused on hospital-based mortality, length of stay and readmission rates.

Action Three: Improvement

The team work closely with trusts to translate variations in data into improvement projects using Quality Improvement (QI) tools and methodologies to deliver, and demonstrate, improved outcomes.

Continued over...

Improving early detection and treatment of sepsis (continued)

Action Four: Share best practice

To spread good practice, share results and promote success the AQ team host sepsis collaborative events twice a year; these have evolved into communities of improvement.

Results

The AQ Sepsis programme has been successful in supporting participating organisations to demonstrably improve the overall standard of care delivered to patients with sepsis in the North West over the last five years. Thirteen Trusts across the region now use the AQ devised measure set to monitor the consistent delivery of care to patients with sepsis.

This collaborative approach has seen a 29% reduction in variation across the region since the inception of the programme, from a 39 - 89% range across participating trusts to a 71 - 92% range.

Read the full case study here

A collaborative approach to reducing patient deterioration

The Advancing Quality Alliance (AQuA) developed a collaborative approach to support organisations to improve their early recognition of the deteriorating patient. The programme combined theory, practical application and group discussions to support learning.

The programme was delivered across three days over nine months; coaching teams in the application and delivery of Quality Improvement (QI) approaches to improve the early detection of deteriorating patients.

At the end of the programme there were seven examples of safety improvement ideas on the deteriorating patient shared.

Action One: Identify opportunities for improvement

Teams applied to participate in the collaborative programme with an identified area of deterioration they want to explore and improve. The programme required the team to include core clinical staff, a Senior Sponsor and to release the time for staff to develop and deliver plans.

Action Two: Devise an action plan

Groups were asked to define all necessary actions and assign responsibility to individuals for delivering these actions within agreed timescales.

Action Three: Develop an aim statement and driver diagram

During the first collaborative session, participants were supported to develop aim statements to address their identified improvement opportunities. A driver diagram is a simple way of organising visually the actions that will help teams to focus on what necessary changes need to be made to achieve their aim.

Continued over...

A collaborative approach to reducing patient deterioration (continued)

Action Four: Planning for improvement

Teams were each required to complete and submit their plans in a one-page template. These plans were completed at Day One and Day Two of the collaborative learning sessions to ensure teams were focused on what they needed to achieve over the 90 day period until the next collaborative.

Action Five: Measurement

In Day One and Day Two of the collaborative, teams monitored their improvements through a variety of available tools. As each team aimed to deliver on a different aspect of deterioration the sharing of the results generates discussions and additional ideas.

Action Six: Sharing and spread

In Day Three of the collaborative, teams presented the results of their work. This presented an opportunity to consolidate and share learning across the teams and was a useful mechanism to share learning.

Results

- Successful reduction in patient harm through implementation of the NEWS2 assessment tool
- Reduction in transfers to ITU, demonstrated through early escalation of deteriorating patient
- Improved communications between health care disciplines in relation to the deteriorating patient
- Local systems devised to support early recognition to deteriorating patients

Read the full case study here

Introduction of the sepsis screening tool

The Parliamentary and Health Service Ombudsman's report 'Time to Act' (2013) focussed on ten cases of death resulting from sepsis. The failings in the care of these patients mainly occurred in the first few hours following the onset of sepsis, when the rapid recognition and initiation of treatment are critical to a patient's chances of survival.

North West Ambulance Service are in a key position as first responders to undertake assessment of the patient and determine diagnosis.

Actions

- **Establish Resource:** NWAS developed a quality improvement (QI) team.
- **Leadership:** Designated clinical leaders to drive improvements and promote the programme across the patient pathway. This included leadership from an Advanced Paramedic and Consultant Paramedic.
- **Education:** An education programme was devised to inform and support on-going learning with regards management of sepsis.
- **Pre-alert:** A tool allowing clinicians to identify sepsis, its severity and the interventions required, including the need to pre-alert.
- **Communication and engagement:** On-going communications through local presentations, shared dashboards of results to ensure enthusiasm of programme of work.
- **Audit:** A bespoke audit process that provides internal assurance through benchmarking, enabling the Trust to assure itself that the screening tool is not only being used but is being applied correctly to the benefit of NWAS patients.

Results

- Successful implementation of a sepsis screening tool deployed that supports standardised assessment of patients.
- 72% of patients with confirmed sepsis survived until discharge.
- Increase from 11% to 66 %, in standbys for patients with suspected sepsis.
- Training template used in sepsis education adopted.
- In the first phase of the audit project 93% of staff were trained.
- Awarded special commendation by the Chairman at the NWAS Star Awards.

Read the full case study here

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