CENTRE FOR HEALTHCARE INNOVATION

CHI Learning & Development System (CHILD)

Project Title

A multidisciplinary clinical pathway for management of hospitalised patients with acute exacerbation of bronchiectasis

Project Lead and Members

Project lead: Dr Albert Lim

Organisation(s) Involved

Tan Tock Seng Hospital

Project Period

Start date: Nov 2013

Completed date: 2014

Aims

To create an evidence based multidisciplinary and coordinated clinical pathway for the management of bronchiectasis.

Project Category

Care Redesign, Process Redesign, Quality Improvement, Safety

Keywords

Tan Tock Seng Hospital, Care & Process Redesign, Quality Improvement, Safe Care, Multidisciplinary Clinical Pathway, Bronchiectasis Exacerbation, Chronic Obstructive Airway Disease, Evidence-based Practice, Coordinated Care, Shortened Length of Stay, Cost Saving, Reduced Readmission Rate, One Care Team, One Care Plan, Respiratory and Critical Care Medicine, Team Work, Preventive Care, Improved Flu Vaccination, Self-Management, Patient Education, Airway Clearance Competency

Name and Email of Project Contact Person(s)

Name: Dr Albert Lim

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CLINICAL SERVICE IMPROVEMENT PROJECT

(This category is for the medical or clinical side of "customer service". Programs of patient centered care belong here as do those that demonstrate physician leadership).

A clinical practice improvement project that was successfully completed in any of the specialized (technical) areas of hospital management, such as Nursing, Laboratory, and Radiology or in specialty clinics such as eye center, kidney center, etc. The project should show measurable results of having improved service, diagnostics and treatment with little or no capital outlay. Are clinical outcomes measured and how well are these measurements used. Is there a program to improve the quality of the doctor-patient relationship? Is there a discernible focus on improving different aspects of the patient physician interaction?

Project Title:

A multidisciplinary clinical pathway for management of hospitalised patients with acute exacerbation of bronchiectasis

Date Project Started:

16 November 2013 (Results in 2014)

Department Name:

Department of Respiratory and Critical Care Medicine

Names of Key Staff Involved in This Project:

1. Dr Lim Yick Hou Albert, Senior Consultant, Medicine Respiratory & Critical Care Medicine
2. A/Prof John Abisheganaden, Senior Consultant, Head, Medicine Respiratory & Critical Care Medicine
3. Ms. Mindy Tay, Senior Pharmacist, Allied Health Services & Pharmacy, Pharmacy
4. Mr Lawrence Xu, Physiotherapists, Allied Health Services & Pharmacy, Physiotherapy
5. Ms. Jaclyn Tan, Physiotherapists, Allied Health Services & Pharmacy, Physiotherapy
6. Ms. Wong Yan Ping, Senior Case Management Officer, Office of Clinical Governance
7. Ms Lily Goh, Manager, Case Management, Office of Clinical Governance
8. Quek Poh Seo, Advanced Practice Nurse, Nursing Service
9. Kalaichelviand, Nursing
10. Sister Shairilin, Nurse Clinician, Nursing

1. Please give some background to the project or program including how it originated. Give details of what clinical improvements were achieved and how the project improved quality of care as a result of these improvements. **MAX 350 WORDS.**

Bronchiectasis is a very common chronic obstructive airway disease worldwide. It is characterised by chronic productive cough with intermittent exacerbation which requires antibiotic treatment. The management of bronchiectasis is multifaceted, targeting bronchial inflammation, eradication, suppression or prevention of bronchial infection, airway clearance and treatment of underlying causal factors. Hospitalisation with acute exacerbation of bronchiectasis is associated with increased morbidity and mortality. Previously, our studies and observations showed prolonged hospitalisation with acute exacerbation of bronchiectasis, inaccurate diagnosis of underlying lung disease, lack of evidence based medicine practice, timely discharge planning, coordination of the health care team's management, discharge criteria and uncertainty of physiotherapy input and vaccination status against influenza and pneumonia.

Thus, we created an evidence based multidisciplinary clinical pathway for the management of hospitalised patients with acute exacerbation of bronchiectasis. This clinical pathway formulated and streamlined the care plan, emphasizing team work and added value with well-defined individual responsibilities. Patients were managed by evidence based care bundle daily. Progress of treatment was evaluated by evidence-based assessment tools daily. There was coordinated discharge planning with evidence based discharge criteria which was used early in the stage of admission. Additionally, it also added value by focusing on the prevention of recurrent exacerbation by vaccination against influenza and pneumonia, and education on airway clearance technique which was the mainline treatment for bronchiectasis. This enabled self-management of bronchiectasis by performing airway clearance by the patients at home. Results have shown that 77% of patients were competent to perform airway clearance of phlegm after discharged. 81% of patients also received vaccinations against influenza which helped to reduce risk of recurrent exacerbations.

This project demonstrated the efficacy, safety and feasibility of an evidence based multidisciplinary and coordinated clinical pathway for the management of this complex airway disease in an acute hospital setting. The reduction in average length of hospital stay by 2 days and the reduced 30-day readmission rate would translate to savings for the patient, besides the risks and downsides of getting readmitted. Interestingly, this was achieved by a clinical pathway with evidence based medicine and team work, with no increase in manpower.

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2. Please describe how the project was beneficial from the patient's perspective and experience, and how it improved patient care, patient safety or service. Preferably please present quantifiable information such as "before and after" measurements if any. **MAX 250 WORDS.**

TTSH sees about 300 bronchiectasis patients a year. The Clinical Pathway *added Value* to the patient by providing better, coordinated and safer care and at lower costs. The benefits are:

Shortened length of hospital stay
The median length of stay for patients was significantly reduced from 6 to 4 days (p=0.023). A total of 60 patients have been through this pathway (who accounted for 71 admission episodes). A shorter length of hospital stay reduced health care cost, risk of hospital acquired infection and stress in hospital.

Reducing hospital readmission
9% readmitted within 30 days of post discharged and 20% readmitted for patients not on the pathway.

Improved patients' airway clearance competency
77% of the patients were competent on airway clearance technique at discharge. There was no record of competency of airway clearance for patients not on the clinical pathway. This was paramount as airway clearance of phlegm is the mainline treatment of bronchiectasis.

Improved flu vaccination status
81% of the patients on the clinical pathway received influenza vaccination. Influenza vaccination was not routinely offered before the clinical pathway implementation. This improved the adherence to recommended evidence-based practice.

Multidisciplinary team approach
This team approach targeted different aspects of bronchiectasis by providing the best treatment at hospital and reduced risk of recurrent exacerbations after discharged. It fostered a "One Care Team, and One Care Plan" approach, so that everyone, including the patient, was on the same page and aware of the care plan and care goals.

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3. Please explain what other benefits were derived? Is it simple yet effective, something other departments can also adopt or adapt? Were appropriate analysis tools used or was it only a matter of throwing money at the problem? **MAX 200 WORDS.**

We made complex care simple and at no cost to the patient. This is an evidence-based multidisciplinary clinical pathway which was designed by a team of various experts on the management of bronchiectasis. It is efficacious, safe and feasible for hospital management of exacerbation of bronchiectasis. This clinical pathway can be easily used by doctors at any level of experience, respiratory and non-respiratory trained. The clinical pathway can be easily adapted for other diseases or conditions, where care coordination and a multi-disciplinary team approach is needed to deliver care. The management process and utilization outcomes in this pathway are auditable for future improvement. The objective assessment tools of the disease activity of this pathway has great potential for identifying and stratifying patients who need more aggressive treatment, longer hospital stay and more frequent follow up. This clinical pathway does not cost anything. From a search of the latest literature, this is the first clinical pathway in Asia and probably the only known clinical pathway for bronchiectasis in the world.

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4. Please explain how significant were the results or outcomes? Are these measurable? Are there testimonials, awards or other support to show impact on improvement of the department or unit's service? **MAX 150 WORDS.**

The outcome of this clinical pathway has demonstrated that bronchiectasis can be successfully managed by a multidisciplinary team with evidence-based medicine. The health care burden is high. In America, the cost of hospitalisation with bronchiectasis is more than US$5000 per patient. The average length of hospital stay for bronchiectasis in Germany is 10 days. Research on new treatment such as antibiotics is expensive and has no impact on length of stay. Our clinical pathway with clinical care bundle and evidence-based medicine targeting different aspects of bronchiectasis has shown promising results on reducing the length of hospital stay, tendency of less recurrent admission and increased patient's competency on airway clearance. More importantly, it is safe and feasible for treatment of acute exacerbation of bronchiectasis by doctors of various level of experience, respiratory trained and non-respiratory trained.

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5. Please give some background to the project team that originated, studied and developed the project or program. **MAX 200 WORDS.**

The project team comprised a multidisciplinary team of doctors, physiotherapists, case managers, pharmacist, ward and respiratory specialty nurses.

Dr Albert Lim is a senior respiratory consultant who is an expert in bronchiectasis. He is interested in outcome prediction and treatment of bronchiectasis. A/Prof John Abisheganaden is a senior respiratory consultant who is experienced in the role of clinical pathway for the management of hospitalised patients with acute respiratory or medical diseases. He advises and champions the successful virtual hospital model of care which manages patients at home. Mr Lawrence Xu is an experienced senior physiotherapist with interest in advance respiratory diseases and intensive care physiotherapy. Ms. Jacyln Tan is a physiotherapist who has special interest on physiotherapy in respiratory disease. Ms Mindy Tay is an experience pharmacist with interest in pharmacology of respiratory diseases. Ms Wong Yan Ping is a senior case manager who is experienced on clinical pathway for respiratory diseases such as COPD and asthma care pathways. Ms Lily Goh is a senior case manager and is experienced with clinical pathways and disease management. Sister Quek is an APN on respiratory disease. Sisters Kalaichelvi and Shairilin are experienced nursing sisters on the respiratory wards.

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6. Please give any other information, including third party testimonial regarding your project which you think would help convince the judges that this project (or program) should win this category. **MAX 300 WORDS.**

The abstract for this project was accepted by the Singapore Health and Biomedical Congress last year and published by the Annals in 2014.

A second abstract looking at the safety and feasibility of the CP has been accepted for poster presentation at the European Respiratory Conference in 2015. (Two abstracts attached).

Word Count: 51 / 300

OP-CR-32

The Efficacy and Safety of a Multidisciplinary Care Pathway for Inpatient Treatment of Acute Exacerbation of Bronchiectasis

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Background & Hypothesis:

Hospitalisation with acute exacerbation of bronchiectasis is associated with increased morbidity and mortality (1,2). Evidence based clinical pathway has been shown effective in managing exacerbation of asthma and COPD. However, it is unknown about the safety and efficacy of a multidisciplinary care pathway on management of hospitalised patients with acute exacerbation of bronchiectasis.

Methods:

A retrospective study on all patients admitted with acute exacerbation of bronchiectasis between November 2013 and April 2014. Age, sex, length of hospital stay and comorbidities were established. Patients were divided into 2 groups: 1) care pathway group (CP), and 2) non-care pathway group (non-CP). The efficacy is defined as the event rate of recurrent hospitalisation with acute bronchiectasis exacerbation within 30 days postdischarge. The safety outcome is defined as the rate of mortality during the study period

Results:

A total of 125 patients were studied; 34 patients were in CP and 91 patients in non-CP group. They were similar in age, gender distribution and comorbidities. The median (IQR) length of hospital stay was significantly lower in the CP than the non-CP 4 ((3-6) vs. 6 (3-10) days; $P = 0.023$). The readmission rate was 9% in the CP and 20% in non-CP (P = NS). The mortality was similar in both groups (9% vs. 10%, P = NS).

Discussion & Conclusion:

This study showed that a multidisciplinary evidence based care pathway for inpatient treatment of bronchiectasis is safe and efficacious. The impact of it will require a prospective study.

The feasibility, efficacy and safety of a multidisciplinary care pathway for in-patient treatment of acute exacerbation of bronchiectasis

Patients admitted with acute exacerbations of bronchiectasis are a distinct population who has a significant morbidity and mortality. There are no known evidence based clinical pathways for the inpatient management of these patients.

Aim:
To evaluate the feasibility, safety and efficacy of an evidence based clinical pathway designed for in-hospital management of patients with acute exacerbations of bronchiectasis.

Method:
A retrospective analysis on all adult patients admitted with acute exacerbations of bronchiectasis between November 2013 and April 2014. Age, sex, length of hospital stay and co-morbidities were established. Patients were divided into 2 groups: 1) care pathway group (CP) and (2) non care pathway group (non-CP). The efficacy is defined as the event rate of recurrent hospitalization with acute bronchiectasis exacerbation within 30 days post discharge. The safety outcome is defined as the rate of mortality within 30 days post discharge.

Results:
A total of 125 patients were identified. 34 patients were in CP and 91 patients in non-CP group. There were no significant differences in age, gender and co-morbidities between the 2 groups. The median (IQR) length of hospital stay was significantly lower in the CP than the non-CP (4(3-6) vs 6(3-10) days; p=0.023). The readmission rate was 9% in the CP and 20% in non-CP (p=NS). The mortality was similar in both groups (9% vs 10%, p=NS).

Conclusion:
Our data suggests that managing patients with acute exacerbations of bronchiectasis using a clinical pathway specifically designed for this group of patients is feasible, safe and efficacious with the potential of reducing hospital length of stay.

ERS Grant for Non CF Bronchiectasis
Bronchiectasis, though very common amongst patients admitted for respiratory problems, is often neglected during clinical decision making. We believe that bronchiectasis is a distinct clinical entity that requires treatment that is tailored for patients' specific needs. We intend to use the grant to help us embark on a prospective study to evaluate the safety and efficacy of a care pathway specifically designed for the management of patients admitted with acute exacerbations of bronchiectasis.