Asthma Clinical Assessment Form and Electronic decision support (ACAFE) project

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Introduction and scope

- Emergency Departments (ED)
  - High acuity
  - Rapid patient turnover
  - Information and communication critical
- Sustainable solutions to clinical pathways, multiple data entry, quality control
- EDSS and integrated clinical management systems designed for ED

Objectives

- Demonstrate collaborative innovation for development of problem orientated solutions
- Develop integrated EDSS using asthma clinical pathway as prototype
- Demonstrate performance improvements using this system

Methods

- Conceptualisation
  - Multiple data entry
  - Inconsistent uptake of clinical pathways
  - Limited quality control
- Literature review
- Collaborative innovation
  - 12 month project
  - Emergency Physicians
  - Health Information Specialists
  - Workflow modeling, data fields and clinical pathways

Methods

- System development
- System evaluation
  - Internal
  - External
- Ethics approval

ACAFE System Evaluation Outcomes	
Category	Indicator
History	Asthma precipitating factors
	Previous Intensive Care admissions
Examination	Oxygen saturations
	Ability to verbalise (words, phrases, sentences)
	Chest ausculation findings
	Peak Flows (pre and post bronchodilator PEF)
	Asthma Severity (mild, moderate, severe)
Discharge	Written asthma plan provided
	Smoking cessation advice provided
	Oral corticosteroids

ACAFE FUNCTIONALITIES

Basic Functions	Patient registration and tracking
	Triage
	Clinical assessment forms
	Management summary
	Medication chart
	Electronic order entry
	Progress notes
	Discharge summary
	Discharge documentation
Clinical Document Management	Automated discharge summary
	Automated asthma management plan
	Treatment order field and management plan linkage
Electronic Decision Support	Asthma severity grading
	Suggested treatment pathways
	Allergy alerts
	Smoking cessation and asthma management plan advice
Performance management	Waiting times, consultation times, time of clinical review
	Alerts for missing data fields
	Tracking multiple patients along clinical pathway
Quality control	Waiting times
	Admission and discharge rates
	Investigation order entry trends
Potential functions	Automated GP electronic communication

HD Michael Dinh (Staff Specialist) 10/05/2007 9:49:06 AM

ACAFE

Patient name: Test Patient 2

Date of birth: 14/05/1985

Triage note: SOB

History of presenting problem:

Patient ID: 18Patient 2

Sex: Male

Triage Category: 1

Triage time: 10/05/2007 9:48:59 AM

Sent to: Waiting room

Completed by: Nurse details

Target Time to disposition is 12:49AM. 3 hrs and 0 mins remaining.

Target Time to notify accepting physician is 2:49PM. 5 hrs and 0 mins remaining.

Target Time to move to inpatient ward is 3:49PM. 6 hrs and 0 mins remaining.

- Registration
- Triage
- Clinical Assessment
- Diagnosis
- Management Plan
- Progress
- Disposition
- Last Updates

Asthma Severity Grade Pending...

- File Management >
- View >
- Search >
- Decision Support >
- Admin reports >
- Logout

ED Assessment | Management | Progress | Disposition

History

Presenting problem	
History of presenting problem	
Associated symptom	☐ Fever ☐ Chills/Sweats/Rigors ☐ Chest Pain ☐ Rash ☐ Vomiting ☐ Diarrhoea
Previous diagnosis of asthma	○ Yes ○ No
Is an asthma background history required?	◉ Yes ○ No

Asthma background history

Asthma onset	☐ Childhood ☐ Adult ☐ Unsure
Precipitating factors	☐ Respiratory Tract Infections ☐ Cold Weather ☐ Exercise ☐ Dust/Pollens ☐ Paroxysmal
Frequency of episodes	☐ Infrequent ☐ Frequent ☐ Constant
Interval symptoms	○ None ○ Nocturnal Cough ○ Wheeze
Does the patient have a management plan?	○ Yes ○ No
Is the patient usually on oral corticosteroids?	○ Yes ○ No

System Alert

Field Comments

History of Changes

HD Michael Dinh (Staff Specialist) 10/05/2007 9:49:06 AM

ACAFE

Patient name: **Test Patient 2**
Date of birth: 14/05/1985
Triage note: SOB

History of presenting problem:

Patient ID: 18Patient 2
Sex: Male

Triage Category: 1
Triage time: 10/05/2007 9:48:59 AM

Sent to: Waiting room
Completed by: Nurse details

Target Time to disposition is 12:49AM. 1 hrs and 55 mins remaining.
Target Time to notify accepting physician is 2:49PM. 3 hrs and 55 mins remaining.
Target Time to move to inpatient ward is 3:49PM. 4 hrs and 55 mins remaining.

- ✔ Registration
- ✔ Triage
- Clinical Assessment
- Diagnosis
- Management Plan
- Progress
- Disposition
- ⊞ Last Updates

SEVERE

- File Management >
- View >
- Search >
- Decision Support >
- Admin reports >
- Logout

ED Assessment | Management | Progress | Disposition

Suggested Management Plan *Progress on Severe asthma - Stable*

TREATMENT	add	SALBUTAMOL	5MG	NEB	EVERY TWENTY MINUTES
INVESTIGATION	add	NIL FURTHER			
CONSULTATION	add	REVIEW WITH SENIOR ED STAFF			
OBSERVATION	add	CONTINUOUS CARDIORESPIRATORY MONITORING			
DISPOSITION	add	ADMIT			

Actual Management Plan *Progress on Severe asthma*

Progress number	1
Date/Time	10/05/2007 10:50:30 AM
Progress Note by	HD Michael Dinh (Staff Specialist)
Note	

System Alert

1. Severe asthma indicator
2. Manage airway, breathing circulation transfer to resuscitation room call for immediate senior ED and anaesthetic assistance

Field Comments

1. Smoking cessation advice sheet to be given
2. If yes then severity grade must be moderate or severe
3. Add investigation laboratory blood culture and chest X ray
4. Suggested Management Plan for treatment order has not been followed, SALBUTAMOL INHALED METERED DOSE INHALER 100MCG/DOSE has been selected with 12 PUFFS, SPACER and EVERY 4 HOURS

⊞ History of Changes

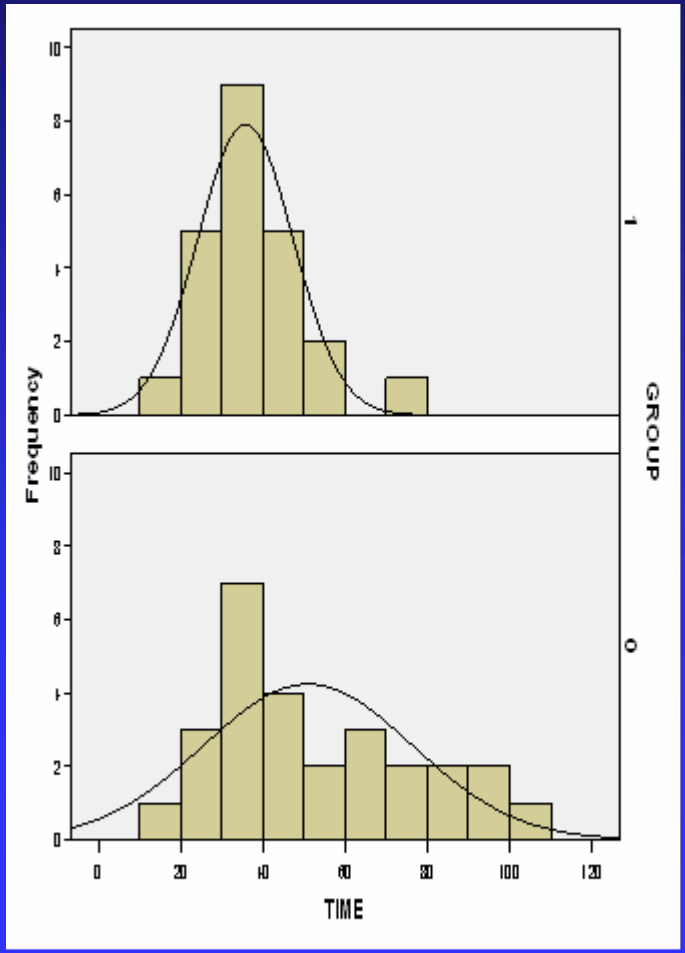
Asthma severity grading

CATEGORY	CLINICAL FIELD	METRIC	MILD	MODERATE	SEVERE
HISTORY	FREQUENCY OF EPISODES		INFREQUENT	FREQUENT/CONSTANT	CONSTANT
	INTENSIVE CARE ADMISSIONS		NO	YES	YES
EXAMINATION GENERAL INSPECTION	CYANOSIS		NO		YES
	PHYSICAL EXHAUSTION		NO		YES
	ALTERED MENTAL STATE		NO		YES
	SPEAKING IN		FULL SENTENCES	PHRASES	WORDS
VITAL SIGNS	PULSE VALUES	BEAT PER MINUTE	<100	120-140	>140 OR <40
	OXYGEN SATURATIONS	%	>95	92-95	<90
RESPIRATORY EXAMINATION	WHEEZE INTENSITY		MILD/VARIABLE/SCATTERED	MODERATE/DIFFUSE/LOUD	SEVERE/SILENT CHEST
SPIROMETRY	PEAK FLOW%	%PREDICTED	>75	50-75	<50
	PEAK FLOW	L/SEC			<100
	FEV_1%	%PREDICTED	>75	50-75	<50
	FEV	L			<1
DIAGNOSIS	CONFOUNDING FACTORS		NIL	CONFOUNDING FACTORS PRESENT	

Results

- System Evaluation
  - Internal
  - External
- Randomised control trial
- Clinical implementation trial

Results – randomised control trial



Study groups and main outcomes (* denotes significant value)							
Category	**Group N (%)**	**PI= 27**	**54%**	**EI= 23**	**46%**	**P value= 0.42**	**K (95%CI)**
Age	Age (yrs) (SD, 95%CI)	30.1	5.72 (27.8-32.3)	32.4	6.11 (29.8 - 33.0)	0.17	
Sex	Male (%)	14	50%	10	43%	0.55	
Seniority	Intern (%)	6	22%	2	9%		
	RMO (%)	6	22%	3	13%		
	SRMO (%)	5	20%	6	26%		
	REG (%)	7	26%	10	43%		
	SS (%)	3	11%	2	9%	0.57	
Documentation	Precipitating factors	26	96.3%	23	100 %	0.35	
	Previous ICU	16	59.3%	23	100 %	0.01	
	O2 Sats	22	81.5%	21	91.3 %	0.32	0.79 (0.56.1.0)
	Chest Auscultation	26	96.3%	23	100 %	0.35	1.00
	Peak Flow	14	51.9%	19	82.6 %	0.02	0.82 (0.65-0.98)
	Speaking	16	59.3%	22	95.7 %	0.03	0.75 (0.53-0.98)
	Asthma Severity	17	63.0%	23	100 %	<0.01*	0.93 (0.81-1.0)
	Smoking Cessation advice	8	29.6%	22	95.7 %	<0.01*	0.96 (0.87-1.0)
	Asthma management plan	15	55.6%	23	100 %	<0.01*	0.82 (0.62-1.0)
	Oral corticosteroids	16	59.3%	20	87.0 %	0.03	0.84 (0.67-1.0)

Discussion

- Dynamic EDSS system prototype
  - Designed by Emergency Physicians for ED
  - 1st reported study using collaborative innovation
  - Clinical pathways, document management, real time quality control
- Problem orientated approach
  - Multiple data entry
  - Clinical guideline compliance
  - Quality control mechanisms
- Improvements in performance measures
  - Asthma documentation quality
  - Improved consultation times
  - Improved discharge information rates

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Acknowledgements

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MSDRG thinking global

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