

*Dr Rachel Graham ST3 EM JCUH ; Hazel Carruthers ACP NCIC

Introduction

- North Cumbria integrated trust ED department manage patients with blunt chest trauma in ED and as inpatients.
- There is extensive literature suggesting that increasing numbers of rib fractures is associated with increased morbidity and mortality.
- Complications include pneumonia, respiratory failure, and empyema.
- There is also evidence to suggest that adequate pain management and aggressive pulmonary support reduces the risk of complications significantly.

Aims

- Review of pain management in patients with blunt chest wall trauma following the 2017 Northern Trauma Network guideline.
- To illicit if improvements can be made in patient pain management at both a hospital and trauma network level.

Methods

- Between 1/6/20 and 31/12/20 all patients who had been diagnosed as having a 'chest injury' via symphony. 48 patients identified.
- A review of pain management undertaken using symphony, ward drug Kardex's, and discharge summaries.
- Audited against the 2017 Northern trauma Network guidelines of advised pain relief. This includes paracetamol, NSAID, morphine PCA and regional anaesthetic techniques.

Results

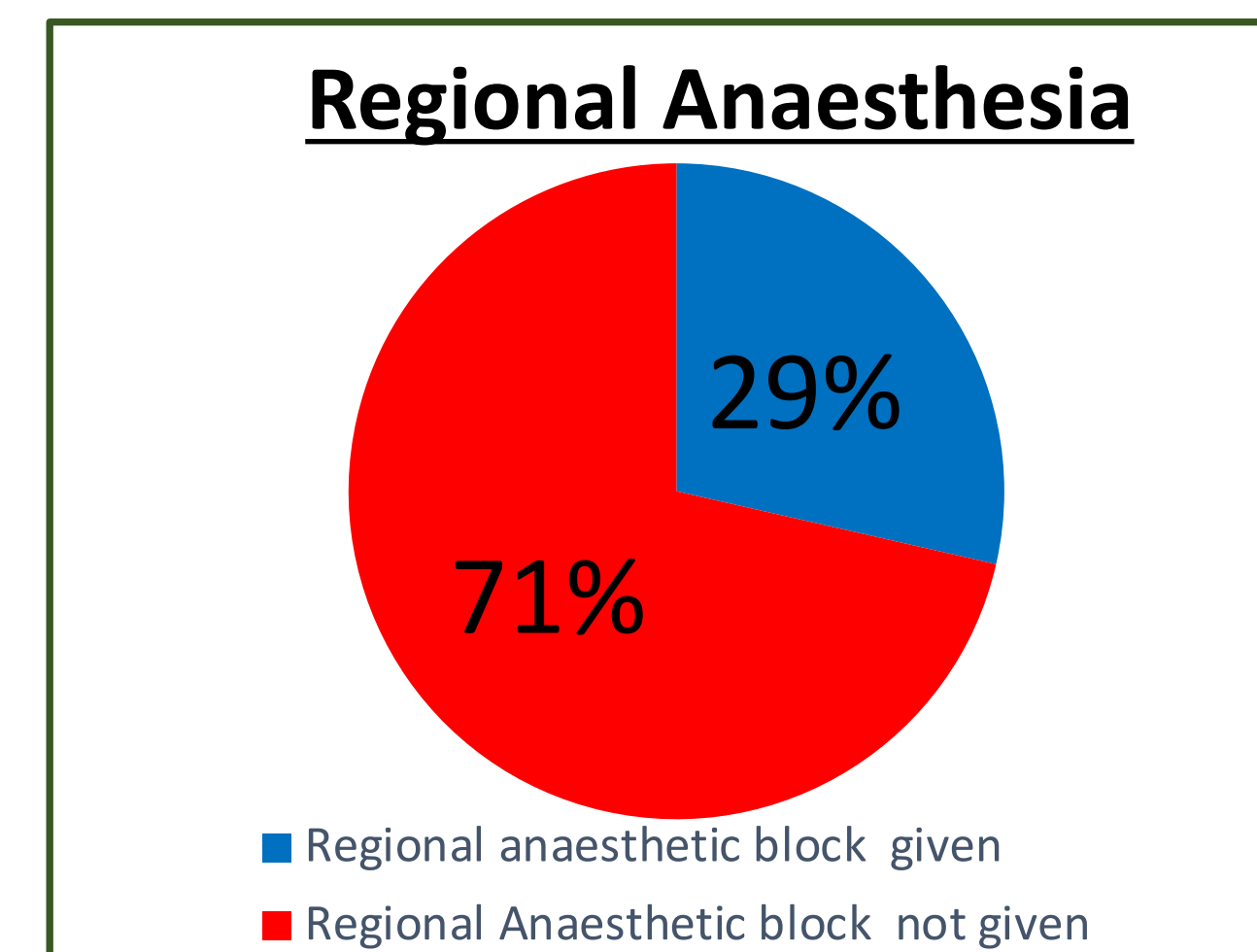
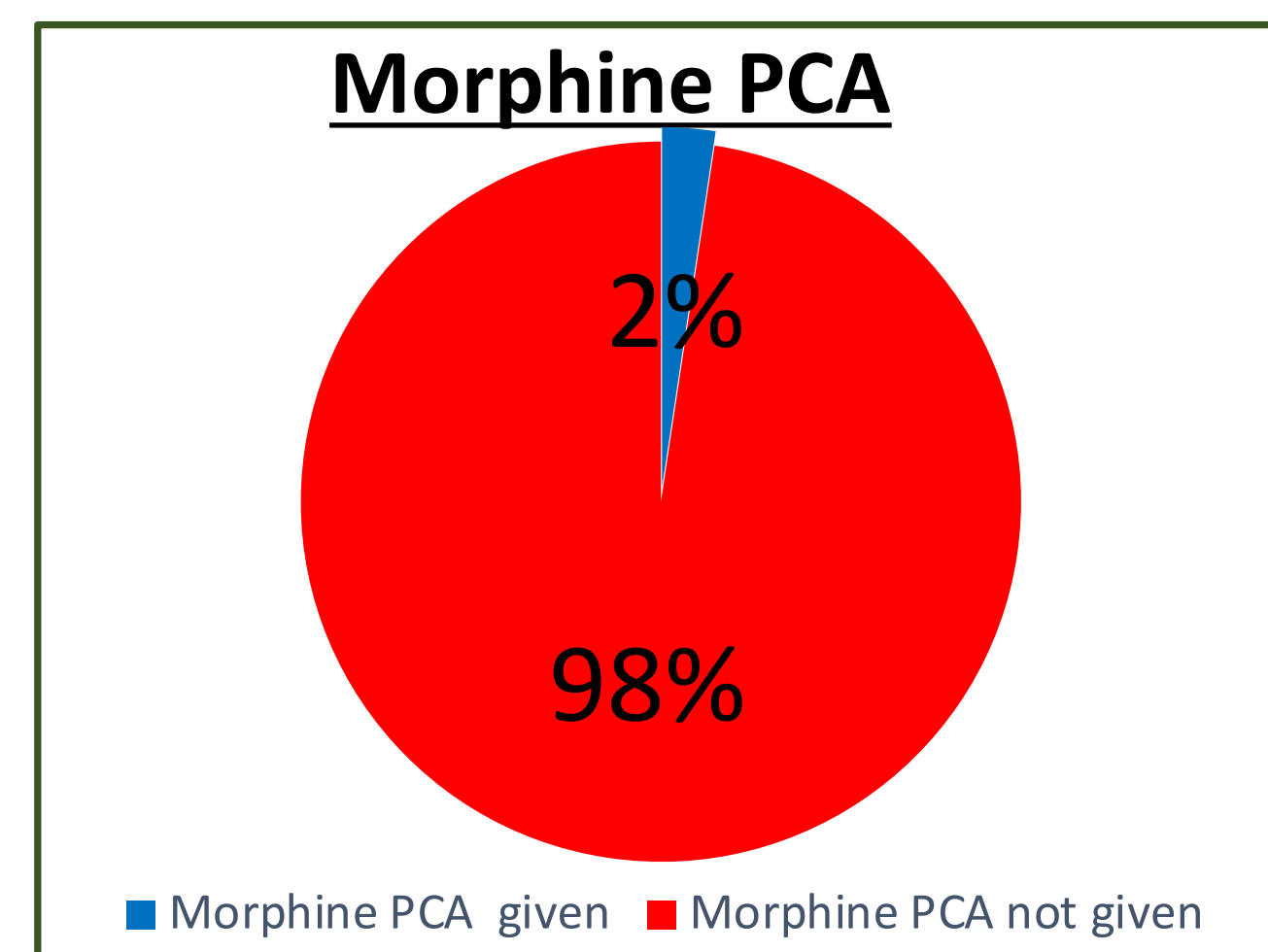
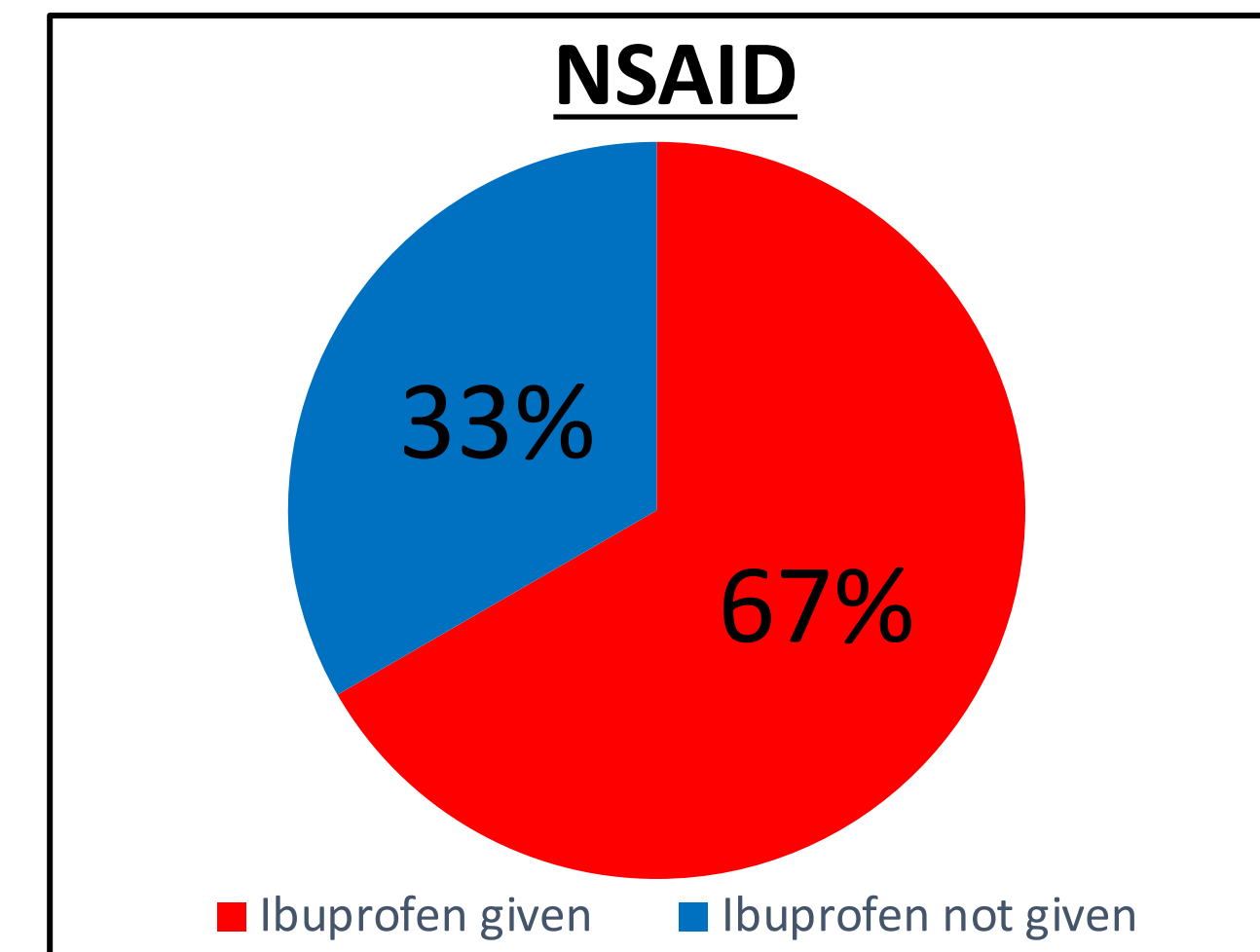
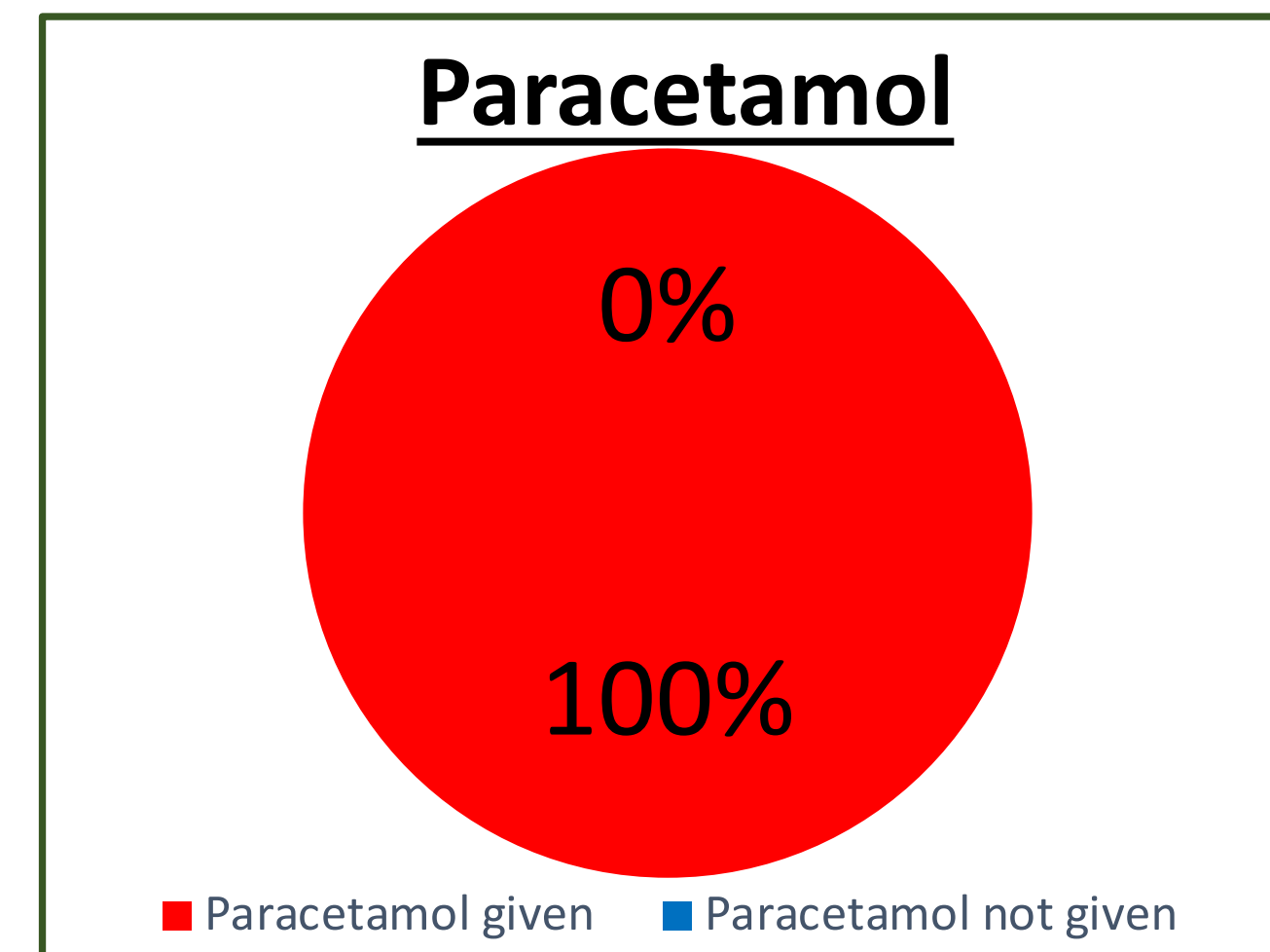
- Of the 48 patients identified 3 patients had no inpatient notes to review, 3 were found to not have any chest wall injury leaving 42 patients to audit.
- 5 patients also transferred to the RVI requiring tertiary centre care.
- 100% of patients received paracetamol during hospital visit
- 67% received NSAIDs
- 2% received a morphine PCA (one patient prior to a ESP block)
- 29 % of patients received a regional anaesthetic block

Results

- 57% of patients received a lidocaine patch and 80% of patients received a form of oral opiate given outside the guideline.

Results

Pie charts showing NCIC compliance with the 2017 Northern Trauma Network guideline of pain management for blunt chest trauma



Discussion

- 23% patients prescribed an NSAID which is difficult to interpret because of all the considerations needed before prescribing as set out in the standard.
- Only one patient prescribed a morphine PCA. However this could be due to patients receiving adequate pain relief from oral opiates (80%), indicating that oral opiates are a good alternative in managing blunt chest trauma pain.
- 29% had a block/catheter inserted. Difficult to ascertain if further patients would have benefitted from blocks, however some patients with flail chests and multiple fractures didn't receive one.
- Patients who did get a block received this several days after admission and again it is difficult to know whether earlier blocks may have eased pain and complications sooner.
- 57% of patients were prescribed a lidocaine patch which is not part of the guideline and there is limited evidence of benefit in the literature
- After presenting the audit locally it was felt that the NTN guideline requires updating to fit with current evidence based practice .

Creation of the New Trauma Blunt Chest Trauma Guideline

- Following the review of this audit and using up to date evidence on blunt chest trauma pain management a new robust pathway has been created, peer reviewed and agreed by the NTN.
- This guideline ensures all patients get consistent pain relief from diagnosis in the ED to discharge.
- It uses a rib assessment score to distinguish which patients require early invasive treatment.
- It provides a patient centred MDT approach to pain management and has been designed to be printed into patient notes.

Rib fracture pathway		
1. Rib fractures confirmed		
Document site and number of rib fractures along with any other findings		
2. Start multimodal analgesia		
Adult patients	Adults >65 years	Renal impairment (eGFR<30)
Initial STAT IV morphine 1-10mg to achieve pain control (repeated as required)	Initial STAT IV morphine in 1-5mg to achieve pain control (repeated as required)	Initial STAT IV morphine 1-5mg to achieve pain control (repeated as required)
Paracetamol 1g PO/IV QDS (if weight <50kg IV dose at 15mg/Kg)	Paracetamol 1g PO/IV QDS (if weight <50kg IV dose at 15mg/Kg)	Paracetamol 1g PO/IV QDS (if weight <50kg IV dose at 15mg/Kg)
Ibuprofen 400mg PO TDS add PPI	Ibuprofen 400mg PO TDS add PPI if no contra-indications	Avoid NSAIDs
Oxycodone MR 5-10mg PO BD	Oxycodone MR 5-10mg PO BD	Oxycodone MR2.5mg-5mg PO BD
Oxynorm 5mg PO PRN 4 hourly	Oxynorm 2.5mg PO PRN 4 hourly	Oxynorm 2.5mg PO PRN 4 hourly
Laxatives prescribed regularly	Laxatives prescribed regularly	Laxatives prescribed regularly
Antiemetics prescribed PRN	Antiemetics prescribed PRN	Antiemetics prescribed PRN
3. Assess risk		
Rib fracture score: BREAKS – total number of breaks (not number of ribs affected) SIDES – unilateral = 1, bilateral = 2 AGE factor <50 = 0 51-60 = 1 61-70 = 2 71 -80 = 3 >80 = 4		(Breaks x sides) + age factor = Rib fracture score
Risk factors for morbidity: <ul style="list-style-type: none"> Pulmonary contusion Current smoker Cardiovascular disease 		
Early review for HDU/MTC transfer if: <ul style="list-style-type: none"> Flail chest > 3 displaced rib fractures > 65 years old 		<ul style="list-style-type: none"> Frailty Obesity Presence of > distant injuries Chest wall deformity CT/CXR with >25% lung volume loss NIV/ventilator dependent
4. Commence appropriate pathway		
Rib fracture score 0-5 If score 0-5 and no other risk factors present consider if discharge with analgesia and chest injury advise is appropriate. If not follow non invasive pathway		Rib fracture score > 6 or high risk for morbidity If score >6 or other high risk factor present consider escalation to invasive pathway .

Conclusion

- The audit of the NTN guidelines from 2017 showed varying compliance and indicated a need for a more up to date guideline to fit with current practice.
- The new guideline has been created and presented to the NTN and decision made role out across the region.