

Early Nutrition and Aggressive Fluid Resuscitation are Associated with Improved Outcomes in Pancreatitis



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- I have no financial relationships to disclose.

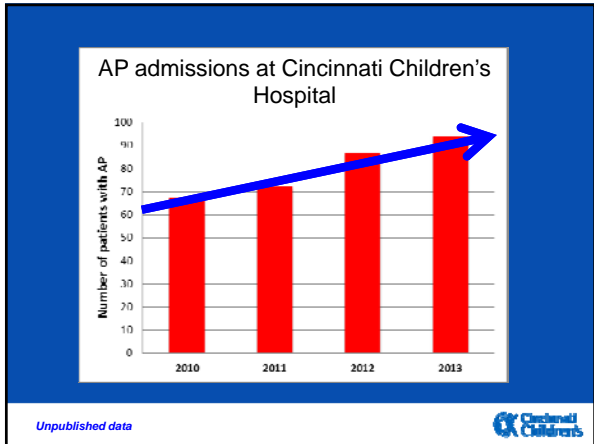


Background

- In the past Acute Pancreatitis (AP) was thought to be an uncommon problem in pediatrics
- In the last two decades, an increased incidence of AP has been observed in the pediatric population

Lopez et al, J Peds 2002
Morinville VD et al Pancreas. 2010 Jan;39(1):5-8.





- Despite the increased incidence in pediatrics, management remains suboptimal since there are no guidelines on management of AP in pediatrics.

Enteral nutrition

Adult literature shows that early (within 24-72 hours) EN results in more favorable outcomes:

- Mortality rate
- Multi-organ failure
- Length of stay (LOS)

Olah A, et al *Langenbecks Arch Surg*. 2010, Eckerwall et al. *Clin Nutr* 2007, Marik. *Curr Opin Crit Care* 2009, Wu et al. *Pancreas* 2010

Adult studies support early aggressive fluid resuscitation

Received > 1/3 of administered 72 hour IVF volume within 24 hours

Outcomes: SIRS, organ failure, ICU, LOS, death



Garnder TB. et al. *Pancreatology*. 2009;9(6):770-6

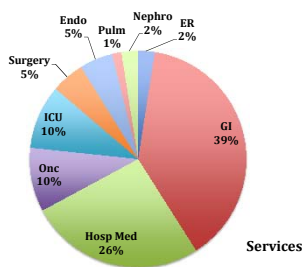
Wardorf MG. et al. *Clinical gastroenterology and hepatology*. 2011



- We aimed to study management approaches to AP at our institution
- Designed a survey that looked at management elements to uncomplicated AP



Data from 284 admission from 2009-2013 to CCHMC




Pancreas 2014. In press



Survey on Management of AP

Presented a healthy 12 year M with a first attack of AP and asked providers on the next best steps in management.




Survey on Management of AP

Questions:
Intravenous Fluid management
Nutrition management

Pain
Imaging
Recurrent attacks

Pancreas 2014. In press




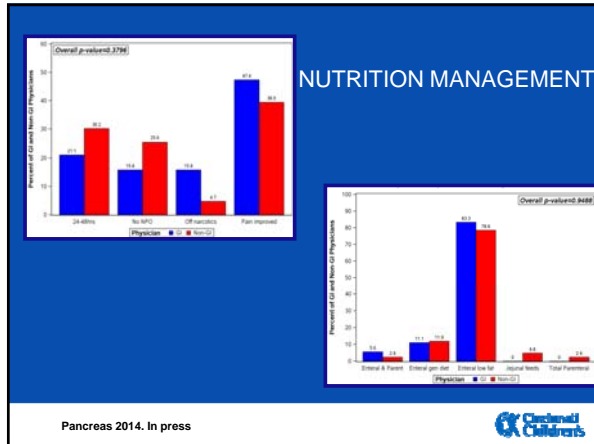
Survey on Management of AP

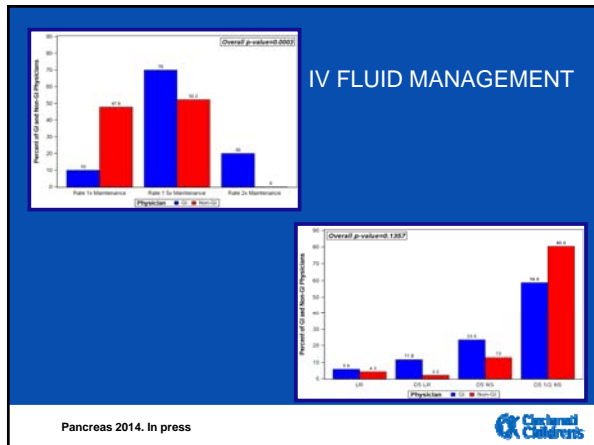
Surveyed 84 MDs GI physicians, non-GI (Emergency and Hospital Medicine).

Responses rate was 80%

Pancreas 2014. In press







Survey on Management of AP

- Management was quite variable from service to service
- Management was variable amongst providers from the same service- Gastroenterology

Pancreas 2014. In press

- Standardization of care is needed
- Standardizing care has led to improved patient outcomes in different medical conditions, and elimination of practice variability would facilitate comparative effectiveness studies

Sox HC, Annu Rev Public Health 2012,
Sox HC, Med Care 2010.



- We developed an intervention in late 2013 in response to our survey results.
- The intervention was based on a well-defined protocol for patients with mild AP
- Centered on aggressive IVF resuscitation on admission
- Early EN in the first 48 hours .



- To allow system delivery that is timely and easy to install.
- Implemented the order set (OS) into our electronic medical record.



Quality Improvement, Clinical Research, and Quality Improvement Research— Opportunities for Integration

Peter Margolis, MD, PhD^{1,2*}, Lloyd P. Provost, MS³,
Pamela J. Schoettker, MS⁴, Maria T. Britto, MD, MPH⁴

Explosion of new discoveries, it is widely anticipated that advances will be translated into much more effective medical care and better health outcomes for patients.

Pediatr Clin N Am 56 (2009) 831–841



Diet

Early enteral nutrition has been shown to improve outcomes in acute pancreatitis:

- Regular Diet For Age
- Infant Feeding With Regular Diet For Age
- Infant Formula Feed
- Breast Fed
- High Cal/Protein Diet
- Full Liquid Diet
- Enteral Feeding
- Progressive/Transition Starting Diet - Clear Liquid
- Progressive/Transition 2nd Diet
- Progressive/Transition 3rd Diet
- Progressive/Transition Goal Diet - Regular Diet For Age
- Progressive/Transition 2nd Diet - Enteral
- Progressive/Transition 3rd Diet - Enteral
- Progressive/Transition Goal Diet - Enteral
- NPO
- NPO Except Meds

IV Fluids

Evidence shows that the outcome of acute pancreatitis is better with early (first 24 hrs) aggressive fluid resuscitation (1.5–2X maintenance). Use NS with higher rates.

- 0.9% NS 1,000 mL IV solution
- 0.9% NS 1,000 mL IV solution
- 0.9% NS 1,000 mL IV solution

- Order set was used on acute pancreatitis admissions from January 2014 until now
- We have about 65% use rate.

Timeline: 2010, 2011, 2012, 2013, 2014, 2015

Order Set

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Aim

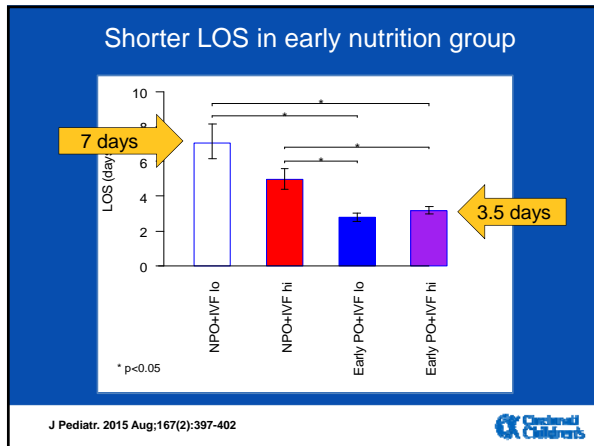
Determine whether recommendations in the Order Set were associated with improved outcomes

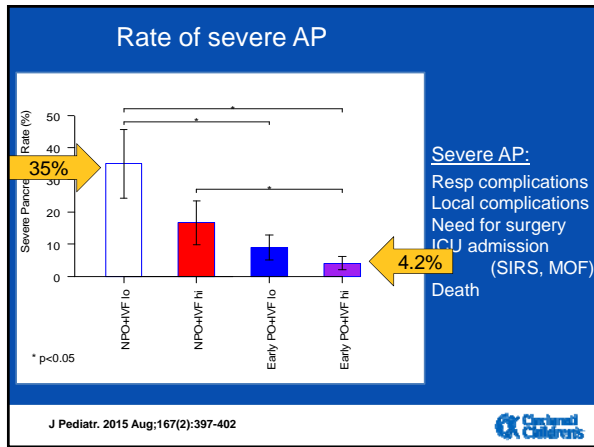
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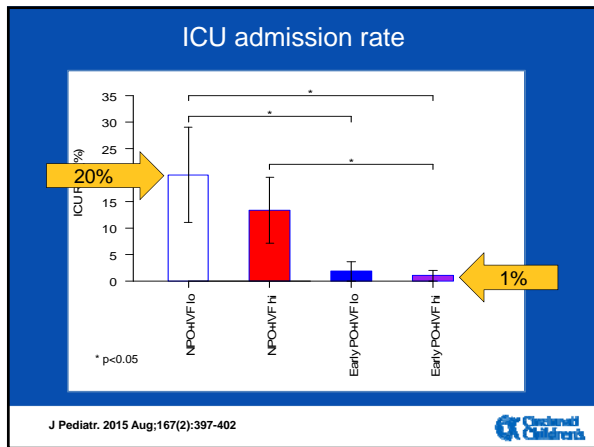
Management groups

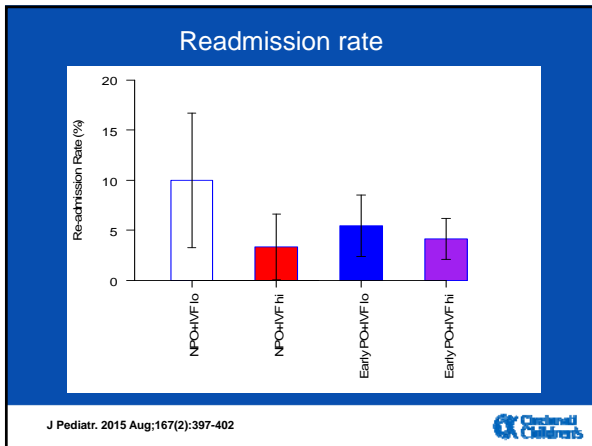
Early PO within 48 hours	Day 1 IVF volume	Number of Encounters	Total
Early PO	High	96 (48%)	201
	Low	55 (27%)	
NPO	High	30 (15%)	
	Low	20 (10%)	

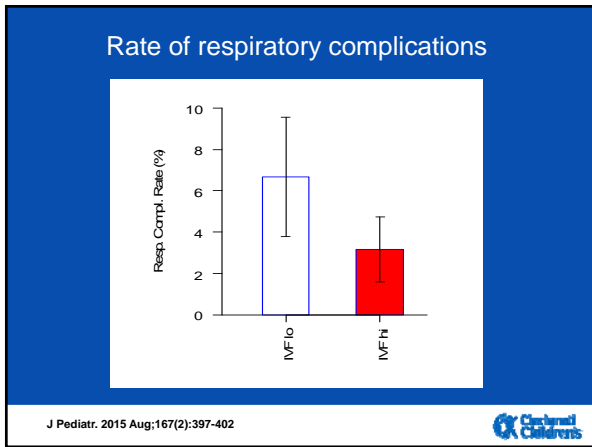
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Conclusions and future directions

- Early enteral nutrition/ early aggressive fluid resuscitation were associated with improved outcomes of pancreatitis.
- Future prospective randomized studies are needed to validate the effects of nutrition and fluid management in pancreatitis.

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