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Application of a frailty index threshold to identify older patients at risk of potentially inappropriate prescribing and adverse drug reactions: A prospective observational study

Dr. Shane Cullinan

27th Jan 2017

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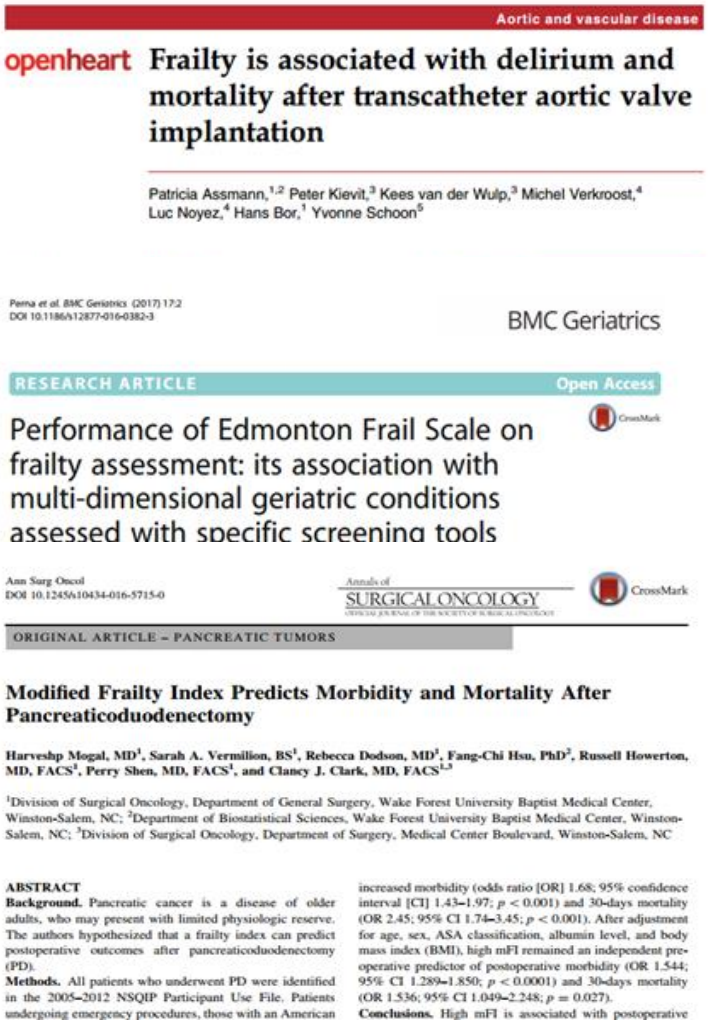
Introduction - Frailty



Aortic and vascular disease

openheart

Frailty is associated with delirium and mortality after transcatheter aortic valve implantation

Patricia Assmann,[1,2] Peter Kievit,[3] Kees van der Wulp,[3] Michel Verkroost,[4] Luc Noyez,[4] Hans Bor,[1] Yvonne Schoon[5]

Perna et al. BMC Geriatrics (2017) 17:2
DOI 10.1186/s12877-016-0382-3

BMC Geriatrics

RESEARCH ARTICLE Open Access

Performance of Edmonton Frail Scale on frailty assessment: its association with multi-dimensional geriatric conditions assessed with specific screening tools

Ann Surg Oncol
DOI 10.1245/s10434-016-5715-0

Annals of SURGICAL ONCOLOGY

ORIGINAL ARTICLE – PANCREATIC TUMORS

Modified Frailty Index Predicts Morbidity and Mortality After Pancreaticoduodenectomy

Harveshp Mogal, MD[1], Sarah A. Vermilion, BS[1], Rebecca Dodson, MD[1], Fang-Chi Hsu, PhD[2], Russell Howerton, MD, FACS[1], Perry Shen, MD, FACS[1], and Clancy J. Clark, MD, FACS[1,3]

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ABSTRACT

Background. Pancreatic cancer is a disease of older adults, who may present with limited physiologic reserve. The authors hypothesized that a frailty index can predict postoperative outcomes after pancreaticoduodenectomy (PD).

Methods. All patients who underwent PD were identified in the 2005–2012 NSQIP Participant Use File. Patients undergoing emergency procedures, those with an American increased morbidity (odds ratio [OR] 1.68; 95% confidence interval [CI] 1.43–1.97; $p < 0.001$) and 30-days mortality (OR 2.45; 95% CI 1.74–3.45; $p < 0.001$). After adjustment for age, sex, ASA classification, albumin level, and body mass index (BMI), high mFI remained an independent preoperative predictor of postoperative morbidity (OR 1.544; 95% CI 1.289–1.850; $p < 0.0001$) and 30-days mortality (OR 1.536; 95% CI 1.049–2.248; $p = 0.027$).

Conclusions. High mFI is associated with postoperative

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journal homepage: www.elsevier.com/locate/expgero

Review

Sex differences in frailty: A systematic review and meta-analysis

E.H. Gordon [a,*], N.M. Peel [b], M. Samanta [c], O. Theou [d], S.E. Howlett [d], R.E. Hubbard [b]

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Effectiveness of an intervention to prevent frailty in pre-frail community-dwelling older people consulting in primary care: a randomised controlled trial

M. Serra-Prat[1,2], X. Sist[1], R. Domenich[3], L. Jurado[4], A. Saiz[3], A. Roces[4], E. Palomera[1], M. Tarradelles[1], M. Papiol[5]

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ARTICLE IN PRESS

ORIGINAL RESEARCH

The Prevalence, Association, and Clinical Outcomes of Frailty in Maintenance Dialysis Patients

So-Young Lee, MD, PhD, Dong Ho Yang, MD, PhD,* Eunah Hwang, MD, PhD,† Seock Hui Kang, MD, PhD,‡ Sun-Hee Park, MD, PhD,§ Tae Woo Kim, MD, PhD,¶ Duk Hyun Lee, MD, PhD,** Kisoo Park, MD, PhD,†† and Jun Chul Kim, MD, PhD‡‡*

Objective: To investigate the clinical implications of frailty in chronic kidney disease patients undergoing maintenance hemodialysis and chronic peritoneal dialysis.

Design: In this prospective study, all of the participants completed the Short Form of the Kidney Disease Quality of Life questionnaire, Korean version, to determine their frailty phenotype. We also obtained blood chemistry and demographic data at enrollment. Data regarding the history of hospitalization and death were collected during the follow-up period.

Subjects: We recruited 1,658 patients (1,255 maintenance hemodialysis and 403 chronic peritoneal dialysis) from multidialysis units (n = 27). We excluded patients who had been hospitalized in the previous 3 months.

Main Outcome Measures: Hospitalization and survival rate during study period.

Results: The participants' mean age was 55.2 ± 11.9 years old, and 55.2% were male. Among the participants, 34.8% were rated as frail

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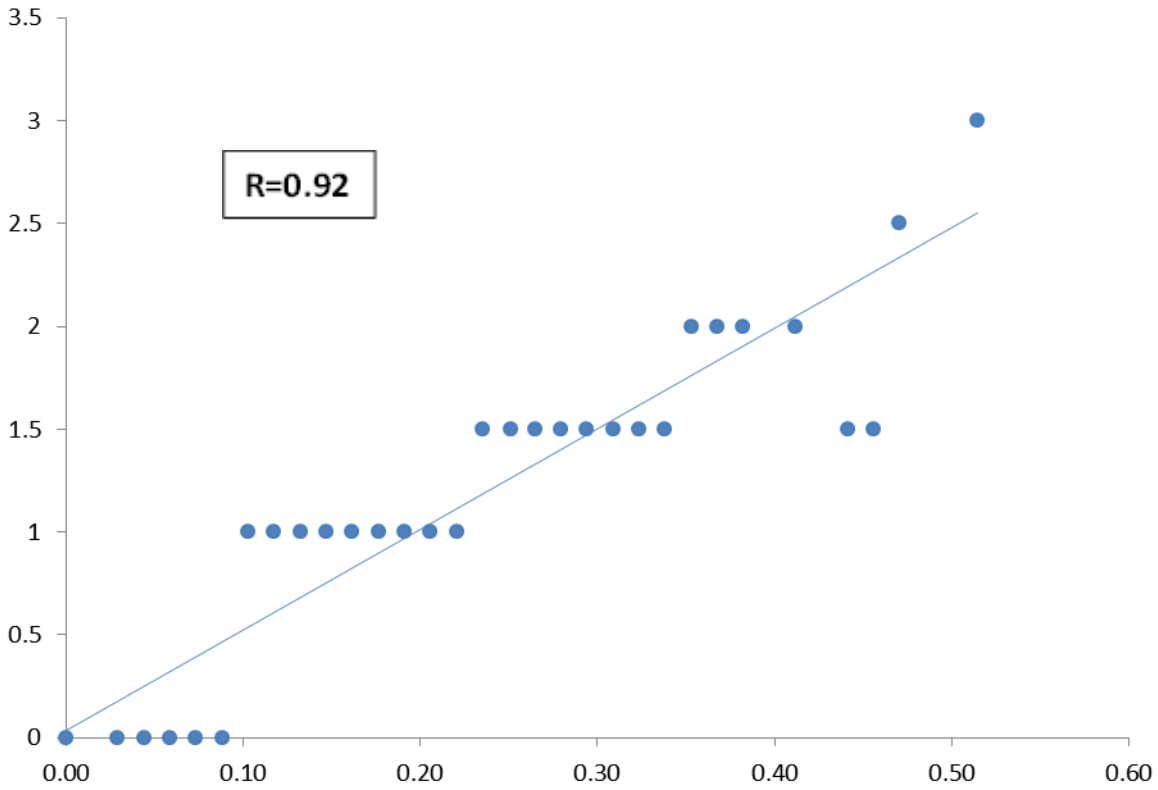
Introduction – Frailty index (FI):Deficit accumulation

Frailty Index Score: 0-1

Score of 0.2 generally accepted as approaching frailty

Introduction – Previous work

Median no. of STOPP breaches



Frailty Index Score

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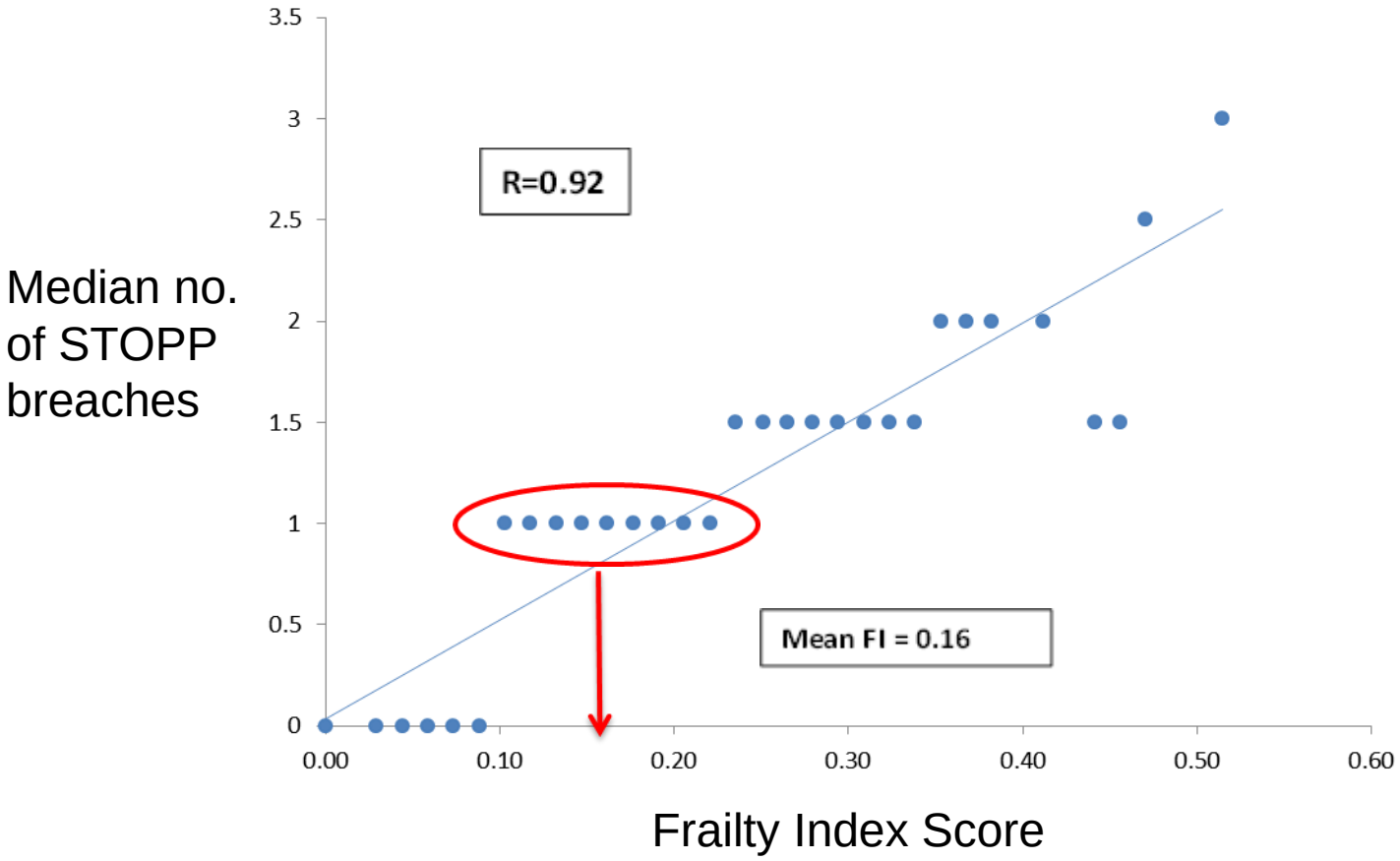
Introduction – Previous work



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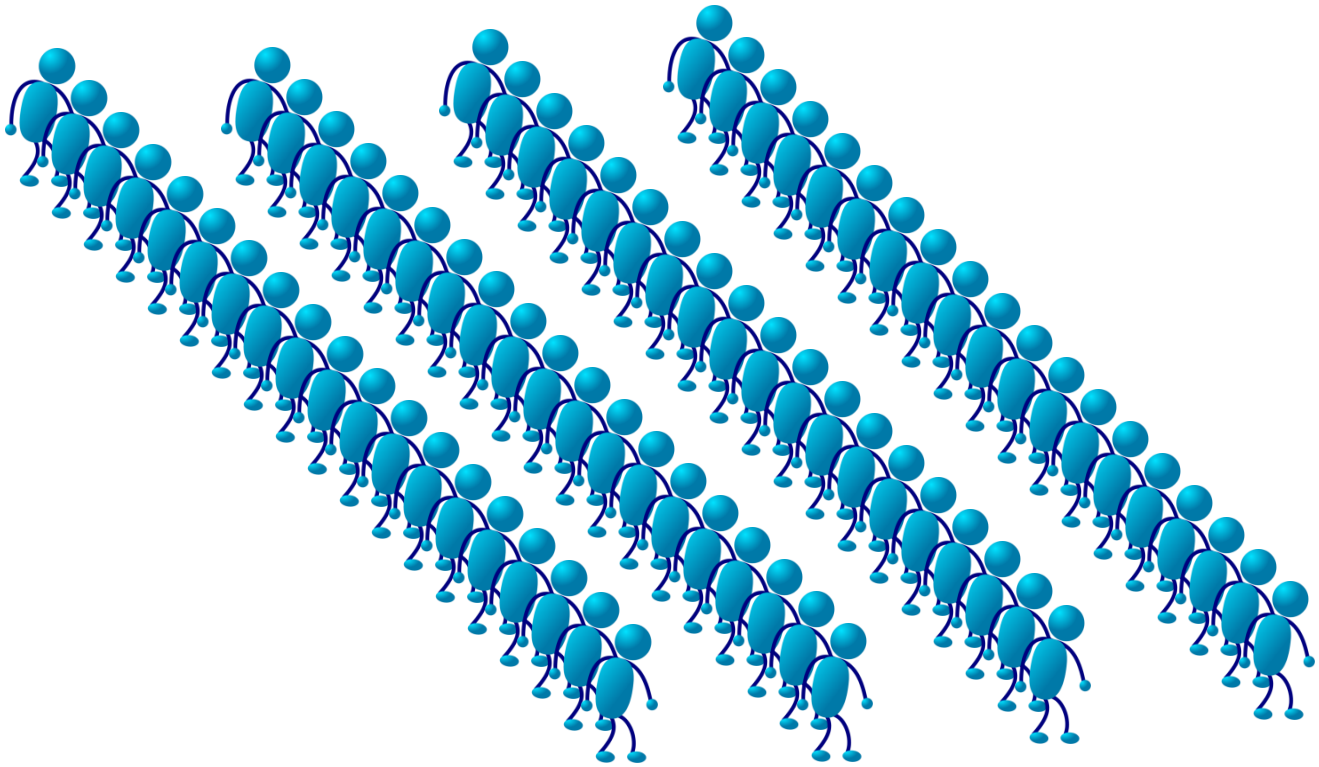
Introduction

- Interim results of preliminary study presented 2 years ago
- Frailty index threshold (FIT) identified
  - PIMs/ADRs twice as likely above this figure
- No. of medications threshold identified
  - PIMs three times as likely in pts taking 6 or more medications
- Prospective study required to validate

Introduction – Where does it ‘FIT’?



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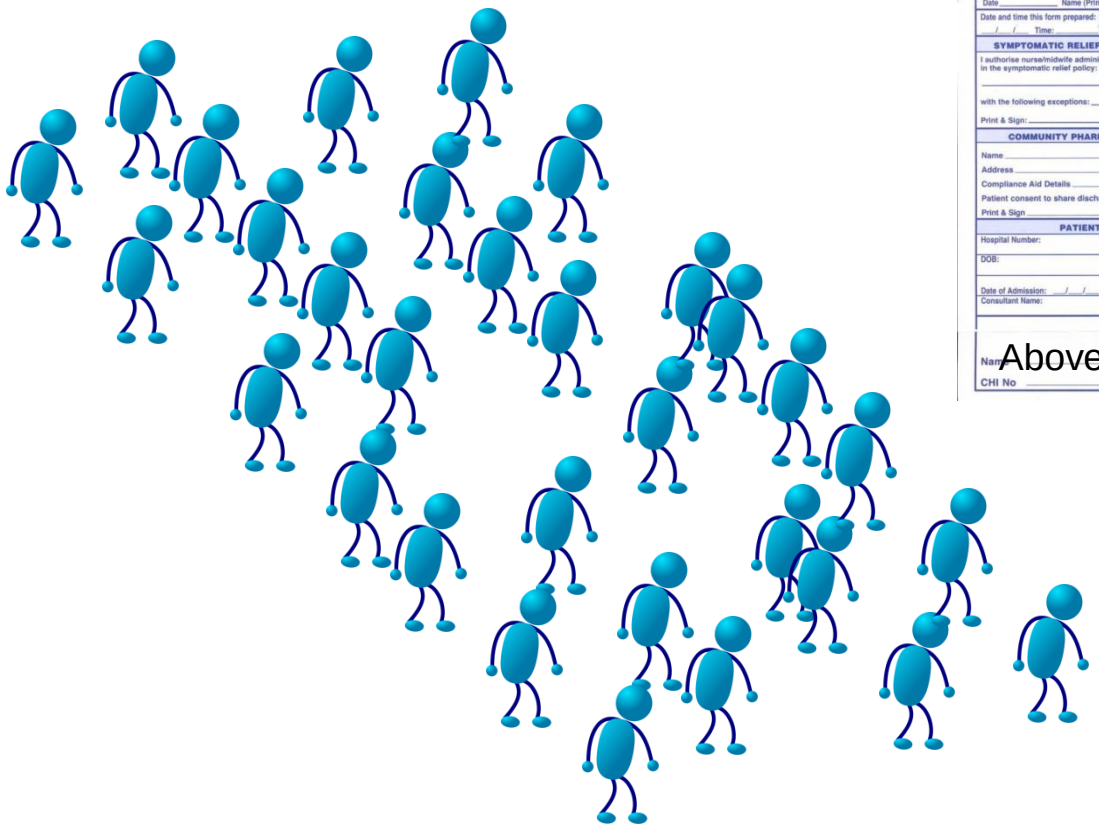
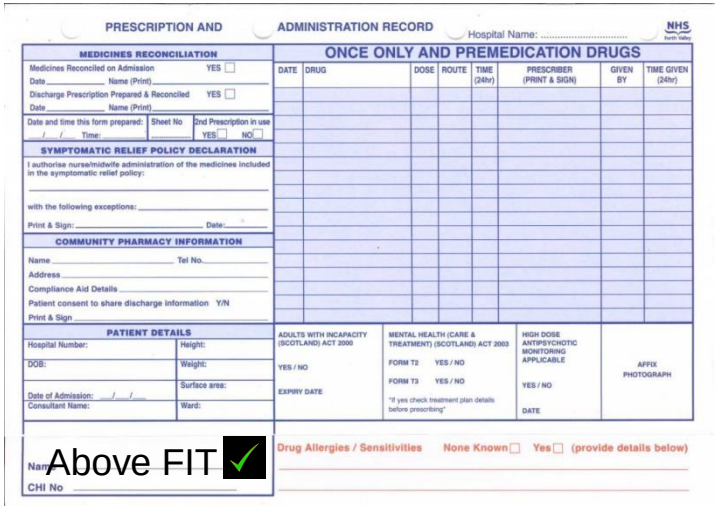
Introduction – Where does it ‘FIT’?





PRESCRIPTION AND ADMINISTRATION RECORD Hospital Name: ..... NHS

MEDICINES RECONCILIATION

Medicines Reconciled on Admission YES ☐
Date ..... Name (Print) .....
Discharge Prescription Prepared & Reconciled YES ☐
Date ..... Name (Print) .....
Date and time this form prepared: / / Time: | Sheet No | 2nd Prescription in use YES ☐ NO ☐

SYMPTOMATIC RELIEF POLICY DECLARATION

I authorise nurse/midwife administration of the medicines included in the symptomatic relief policy:
with the following exceptions:
Print & Sign: Date:

COMMUNITY PHARMACY INFORMATION

Name Tel No.
Address
Compliance Aid Details
Patient consent to share discharge information Y/N
Print & Sign

PATIENT DETAILS

Hospital Number: | Height:
DOB: | Weight:
Date of Admission: / / | Surface area:
Consultant Name: | Ward:

Name
CHI No

ONCE ONLY AND PREMEDICATION DRUGS

DATE	DRUG	DOSE	ROUTE	TIME (24hr)	PRESCRIBER (PRINT & SIGN)	GIVEN BY	TIME GIVEN (24hr)

ADULTS WITH INCAPACITY (SCOTLAND) ACT 2000
YES / NO
EXPIRY DATE

MENTAL HEALTH (CARE & TREATMENT) (SCOTLAND) ACT 2003
FORM T2 YES / NO
FORM T3 YES / NO
"If yes check treatment plan details before prescribing"

HIGH DOSE ANTIPSYCHOTIC MONITORING APPLICABLE
YES / NO
DATE

AFFIX PHOTOGRAPH

Drug Allergies / Sensitivities None Known ☐ Yes ☐ (provide details below)

Above FIT ✓

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Methods

- FI developed as per published guidelines
- Applied to comprehensive geriatric assessments for 545 patients
  - 6 European clinical sites
- PIM/ADR prevalence determined above and below FIT
- PIM/ADR prevalence determined above and below “number of medications” threshold of 6.
- PIM/ADR dependence on frailty status/no. of medications determined through chi-square test
- Risk associated with being in either cohort assessed by calculating odds ratios

Results

Patients with FI score ≥ to 0.16	**% Experiencing at least 1 ADR**	**Odds ratio and 95% CI**	**Chi-square**	***p* value**
	51.3% (Compared to 26.9% of patients with FI < 0.16)	2.86 (1.51, 5.42)	11.114	0.001
	% Experiencing at least 1 instance of PIM	**Odds ratio and 95% CIC**	**Chi-square**	***p* value**
	68.7% (Compared to 59.6% of patients with FI < 0.16)	1.49 (0.83, 2.67)	1.755	0.185
Patients taking more than 6 medications	**% Experiencing at least 1 ADR**	**Odds ratio and 95% CI**	**Chi-square**	***p* Value**
	51.1% (Compared to 45.1% of patients with less than 6 medications)	1.27 (0.89 , 1.81)	1.726	0.189
	% Experiencing at least 1 instance of PIM	**Odds ratio and 95% CIC**	**Chi-square**	***p* value**
	75.2% (Compared to 55.4% of patients with less than 6 medications)	2.45 (1.68 , 3.57)	21. 926	<0.0001

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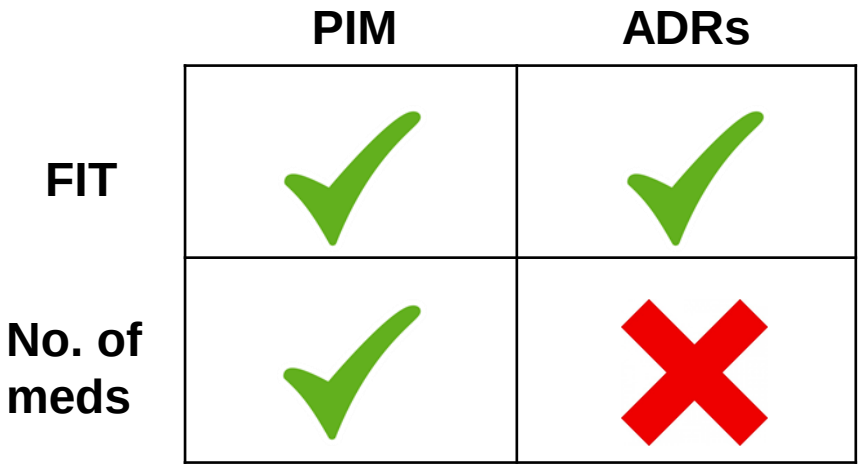
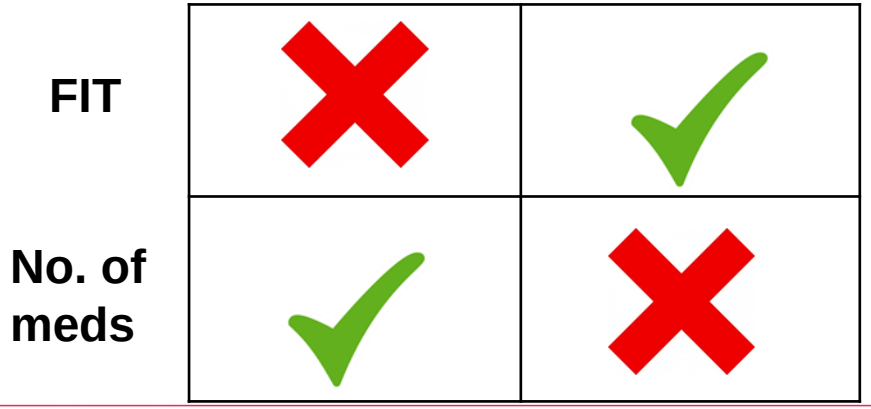
Results – Study 1 Vs Study 2



Study 1



Study 2

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Conclusions

- **FIT** showed strong association to ADRs in both studies
- **No. of meds** showed strong association to PIMs in both studies
- Use of both would seem best practice
- Needs testing in clinical setting

What remains unknown?

- Does an indicator such as FIT trigger doctors to review and assess patients' prescriptions with respect to appropriateness?
- Does this in turn lead to improved patient outcomes?
- Incorporation into electronic systems?

Acknowledgments

- SENATOR team
- SoP UCC
- SoP RCSI

FI variable criteria

- The variables must be deficits associated with health status
- A deficit's prevalence must generally increase with age
- Similarly, the chosen deficits must not saturate too early
- When considering the candidate deficits as a group, the deficits that make up an FI must cover a range of systems
- If a single FI is to be used on a sample of patients, the items that make up the FI need to be the same from one iteration to the next.