Baseline characteristics and clinical outcomes of older surgical persons admitted to a tertiary hospital. Proactive care of older people in General Surgery (Salford-POPS-GS)

13th EUGMS Congress
Oral communication

Arturo Vilches-Moraga, Jenny Fox, Alex Gomez-Quintanilla, Maevis Tan, Areej Paracha, Mohammad Moatari, Luciana Miguel-Alhambra, Molley Rowley, Angeline Price

22nd September 2017
Disclosure of conflict of interests

• I am a geriatrician… No other conflicts of interest
Overview

- Older patient admitted to General Surgery. Key facts
- The set up: Salford-POPS-GS
- Results: baseline characteristics and clinical outcomes
- Key messages
Surgery in the older person

- Elective surgery

**Figure 5** Rate of elective colorectal excision procedures, by age

**Figure 7** Rate of elective cholecystectomies, by age
Surgery in the older person

- Emergency surgery

**Figure 10** Rate of emergency finished admission episodes (FAEs) for inguinal hernia repair procedures, by age
Conundrums in Emergency General Surgery

- Optimum model of care for patients admitted to surgery
- Optimum models of preoperative optimisation prior to surgery
- Most accurate risk prediction tool
General Surgical Care Pathway

- **Surgical/ Anaesthetic**
  - Early diagnosis/risk stratification
  - Early decision making/intervention
  - High dependency care vs ward level care
General Surgical Care Pathway

- **Medical**
  - Multimorbidity
  - Polypharmacy
  - Complications

Assess
- Patient, frailty
- Disease, severity
- Treatment alternatives
- Outcome perspectives

Monitor
- Organ systems, support
- Treatment response
- Complications

Act
- Surgical plan
- Non-surgical plan
- Recovery plan
- Functional level
Risk factors for adverse outcomes in older patients

- Cognitive impairment
- Incontinence
- Mobility reduction
- Functional impairment
- Undernutrition
- Frailty

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**Table 4. Preoperative Assessment and Optimization in the Older Patient**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Assessment</th>
<th>Preoperative Optimization Strategies</th>
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<tbody>
<tr>
<td>Cognition</td>
<td>Mini-Cog Test(^{74}) 3-Item recall Clock draw Identify risk factors for delirium(^ {71}) Visual and hearing impairment Alcohol abuse Medications</td>
<td>Formal assessment by geriatrician for patient identified to have cognitive impairment on screening(^{75}) Remind patient to be bring all assistive devices (glasses, hearing aids) to hospital Limit use of sedating psychotropic medications preoperatively(^ {76})</td>
</tr>
<tr>
<td>Function</td>
<td>Evaluate ability to perform activities of daily living and instrumental activities of daily living Obtain history of falls(^ {75}) Timed up and go test of more than 15 seconds(^ {77})</td>
<td>Refer patients with functional deficiencies or history of falls for formal evaluation by a physical therapist before surgery(^ {78,79}) Obtain assistive devices Plan for in-hospital and postdischarge rehabilitation therapy</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Perform a Mini Nutritional Assessment(^ {80}) Measure albumin and prealbumin levels</td>
<td>Patients at severe nutritional risk by Mini Nutritional Assessment should be referred to dietician for formal assessment(^ {78,79}) Consider preoperative nutritional supplementation in patients at severe nutritional risk according to European Society for Parenteral and Enteral Nutrition guidelines(^ {78,81})</td>
</tr>
<tr>
<td>Frailty</td>
<td>Assess for the following indicators of frailty(^ {72,82}) Mini-Cog score of 3 or less Albumin level of 3.3g/dL or less More than 1 fall in the last 6 months Hematocrit level of less than 35% Timed up and go test of more than 15 seconds More than 3 comorbidities</td>
<td>Consider preoperative strength training(^ {78,79}) Provide nutritional supplementation(^ {78,79})</td>
</tr>
</tbody>
</table>
Geriatric Care needed…

• Need for specialist input by Medicine for the Care of Older People (MCOP) teams in the perioperative period
• Older patient admitted to General Surgery. Key facts
• The set up: Salford-POPS-GS
• Results: baseline characteristics and clinical outcomes
• Key messages
The set up

- 850-bedded urban teaching hospital serving 240,000
- Tertiary renal, neurosurgery, major trauma and stroke centre
- >300 general surgical admissions/year
Usual care

- 25 bedded Male & 25 bedded Female wards

Surgical and nursing staff, Anesthetist, pharmacist, discharge coordinator, dietician, IV team, social worker, Age UK, Rapid Response, Intermediate care, physiotherapist, Occupational therapist, ad hoc specialist assessments

CPEX = Cardiopulmonary Exercise Testing  
ERAS = Enhanced Recovery After Surgery
Salford-POPS-GS in-reach Service

- Proactive, daily case finding service for patients over 74-years of age
- **Core team:** Senior nurse, physiotherapist, Occupational therapist, geriatrician
  (4 DCC PA shared between 2 consultants)

- Comprehensive Assessment
- Targeted Multidisciplinary interventions
- Timely Discharge Planning. EDD
MDT meeting, Ward B1

This patient is currently receiving multidisciplinary team care on Ward B1

Medical Summary

82 year old independent type 2 diabetic on diet (HbA1c 49), hypertensive, severe mitral regurgitation with preserved LVEF and permanent atrial fibrillation not on anticoagulation, peripheral vascular disease (left calf claudication at 100m), Chronic kidney disease stage 3 (eGFR 55) and pulmonary TB 1946.

Medications: Furosemide 40mg Mane, Ferrous Fumarate 210mg TDS, Atorvastatin 10mg Nocte, Atenolol 50mg Mane, Aspirin (Dispersible) 75mg Mane, Adcal D3 ONE BD, Irbesartan 75mg Mane. No Allergies

Elective admission 13/01/2015 (laparoscopic right hemicolecotomy with anastomosis formation Dukes A) SHDU Stay 8 days (13 to 20/01) Complications: Hypotension, AKI (no hydronephrosis on US Abdominal nor AUR and successful TWOC 20/01) and hyperpotassaemia 5.3 due to dehydration and iatrogenia (irbesartan and frusemide), faecal loading, fast AF without heart failure, NN anaemia on iron supplements 121, intraabdominal sepsis and hypoactive delirium 21/01

Social and functional assessment:

Lives alone in a house. No Package of care. Daughters help
Personal activities of daily living - independent
Domestic & Community activities of daily living - Daughters cook, clean and help with shopping
Mobility - No aids
Cognition - No concerns
Mood - Good
Continence- Continent
Skin - Intact
Devices- None
Nutrition and Hydration - No concerns
Alcohol: No Smoker: No

Harm Free Care

HAT assessment: Completed. On LMWH
Devices: None
Ceiling of Care: Full

Working Diagnosis:

Elective laparoscopic right hemicolecotomy with anastomosis formation Dukes A
Hypotension, AKI (no hydronephrosis on US Abd nor AUR and successful TWOC 20/01) and hyperpotassaemia 5.3 due to Dehydration and iatrogenia (irbesartan and frusemide)
Paroxysmal fast AF without heart failure
Constipation and faecal loading
NN anaemia on iron supplements
Intraabdominal sepsis
Hypoactive delirium 21/01
Raised Alkaline Phosphatase in keeping with above

Plan/Suggestions:

Avoid atenolol/irbesartan and frusemide (still hypotensive and at risk of renal artery stenosis)
Omit atorvastatin over next few days
Complete antibiotic/VSL courses as advised by microbiology. No escalation required.

Bloods as requested today (including TSH, anaemia screen, HbA1c and lipid profile)

MDT assessment

EDD 26/01/2015
• Older patient admitted to General Surgery. Key facts
• The set up: Salford-POPS-GS
• Results: baseline characteristics and clinical outcomes
• Key messages
8th September 2014 to 28th February 2017

- 719 index admissions
  - 577 Emergency
  - 142 Elective

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<th>Emergency</th>
<th>Elective</th>
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<td><strong>Surgery</strong></td>
<td>259 (36%)</td>
<td>135 (23.3%)</td>
<td>124 (87.3%)</td>
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<td><strong>Non-Surgical Procedure</strong></td>
<td>111 (15%)</td>
<td>102 (17.7%)</td>
<td>9 (6.3%)</td>
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<tr>
<td><strong>Medical</strong></td>
<td>349 (49%)</td>
<td>340 (58.9%)</td>
<td>9 (6.3%)</td>
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### Diagnoses

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<tr>
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<tr>
<td>% (N)</td>
<td>100% (142)</td>
<td>6.3% (9)</td>
<td>6.3% (9)</td>
<td>87.4% (124)</td>
<td></td>
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<tr>
<td>Cancer</td>
<td>70.4% (100)</td>
<td>14.7% (50)</td>
<td>19.6% (20)</td>
<td>17.0% (23)</td>
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<tr>
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<td>0%</td>
<td>0%</td>
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<tr>
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<tr>
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<td>4.4% (6)</td>
<td>3.0% (4)</td>
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<td>0%</td>
<td>0%</td>
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<tr>
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<td>0%</td>
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<tr>
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<td>0%</td>
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## Baseline characteristics

### EMERGENCY

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<th>Non-surgical procedure</th>
<th>Surgical intervention</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>% (N)</td>
<td>577</td>
<td>58.9% (340)</td>
<td>17.7% (102)</td>
<td>23.4% (135)</td>
</tr>
<tr>
<td>Age (y), mean ± SD</td>
<td>82.9 ± 5.7</td>
<td>83.1±5.9</td>
<td>82.9±6.0</td>
<td>82.4±4.9</td>
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<tr>
<td>Female</td>
<td>56.2 (324)</td>
<td>58.8% (200)</td>
<td>56.9% (58)</td>
<td>48.9% (66)</td>
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<tr>
<td>Nursing or Residential home</td>
<td>7.1% (41)</td>
<td>8.8% (30)</td>
<td>5.6% (6)</td>
<td>3.7% (5)</td>
</tr>
<tr>
<td>Independent</td>
<td>78.6% (454)</td>
<td>73.7% (251)</td>
<td>83.3% (85)</td>
<td>87.4% (118)</td>
</tr>
<tr>
<td>Basic ADLs</td>
<td>52.8% (303)</td>
<td>48.8% (165)</td>
<td>48.0% (49)</td>
<td>66.4% (89)</td>
</tr>
<tr>
<td>Mobile no aids/stick</td>
<td>69.2% (399)</td>
<td>65.6% (223)</td>
<td>72.5% (74)</td>
<td>75.6% (102)</td>
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<tr>
<td>No cognitive impairment</td>
<td>81.3% (469)</td>
<td>78.5% (267)</td>
<td>83.3% (85)</td>
<td>86.7% (117)</td>
</tr>
<tr>
<td>Medications</td>
<td>8.4 ± 4.2</td>
<td>8.7±4.2</td>
<td>8.6±3.9</td>
<td>7.4±4.1</td>
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<tr>
<td>Comorbidities</td>
<td>5.5 ± 2.6</td>
<td>5.6±2.6</td>
<td>5.5±2.4</td>
<td>5.2±2.7</td>
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<tr>
<td>ASA Class I-II</td>
<td>35.7% (206)</td>
<td>35% (119)</td>
<td>22.6% (23)</td>
<td>47.4% (64)</td>
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### ELECTIVE

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<tr>
<td>% (N)</td>
<td>142</td>
<td>6.3% (9)</td>
<td>6.3% (9)</td>
<td>87.4% (124)</td>
</tr>
<tr>
<td>Age (y), mean ± SD</td>
<td>79.9 ± 3.6</td>
<td>81.1±4.0</td>
<td>79.4±3.3</td>
<td>79.9±3.6</td>
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<tr>
<td>Female</td>
<td>51.4 (73)</td>
<td>66.7% (6)</td>
<td>66.7% (6)</td>
<td>49.2% (61)</td>
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<tr>
<td>Nursing or Residential home</td>
<td>0.7% (1)</td>
<td>0%</td>
<td>0%</td>
<td>0.8% (1)</td>
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<tr>
<td>Independent</td>
<td>98.6% (140)</td>
<td>100% (9)</td>
<td>88.9% (8)</td>
<td>99.2% (123)</td>
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<tr>
<td>Basic ADLs</td>
<td>88.0% (125)</td>
<td>77.8% (7)</td>
<td>77.8% (7)</td>
<td>89.5% (111)</td>
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<td>Mobile no aids/stick</td>
<td>92.3% (131)</td>
<td>100% (9)</td>
<td>88.9% (8)</td>
<td>91.9% (114)</td>
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<tr>
<td>No cognitive impairment</td>
<td>95.8% (136)</td>
<td>99.9% (9)</td>
<td>100% (9)</td>
<td>96.0% (119)</td>
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<tr>
<td>Medications</td>
<td>6.2 ± 4.1</td>
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<td>8.3±5.1</td>
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<td>4.6 ± 2.4</td>
<td>5.0±1.4</td>
<td>4.4±1.9</td>
<td>4.6±2.5</td>
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<tr>
<td>ASA Class I-II</td>
<td>51.4% (73)</td>
<td>33.3% (3)</td>
<td>22.2% (2)</td>
<td>54.8% (68)</td>
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Clinical outcomes - type of intervention

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<th>Surgical intervention</th>
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<tr>
<td>Cognitive impairment</td>
<td>% (N)</td>
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<tr>
<td>Admission</td>
<td>18.7% (108)</td>
<td>21.5% (73)</td>
<td>16.7% (17)</td>
<td>13.3% (18)</td>
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<td>Discharge</td>
<td>15.6% (84)</td>
<td>18.0% (56)</td>
<td>11.0% (11)</td>
<td>13.5% (17)</td>
<td>0.034</td>
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<tr>
<td>Independent</td>
<td>% (N)</td>
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<tr>
<td>Basic ADLs</td>
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</tr>
<tr>
<td>On admission</td>
<td></td>
<td>78.6% (462)</td>
<td>73.7% (249)</td>
<td>83.3% (85)</td>
<td>0.002</td>
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<td></td>
<td></td>
<td>75.7% (405)</td>
<td>73.3% (224)</td>
<td>84.0% (84)</td>
<td>0.05</td>
</tr>
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<td>p</td>
<td>&lt;0.001</td>
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<td>NS</td>
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<td>0.001</td>
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<td>Instrumental ADLs</td>
<td>% (N)</td>
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</tr>
<tr>
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<td></td>
<td>52.8% (303)</td>
<td>48.8% (165)</td>
<td>48.0% (49)</td>
<td>0.01</td>
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<td>53.8% (287)</td>
<td>50.8% (157)</td>
<td>54.0% (54)</td>
<td>NS</td>
</tr>
<tr>
<td>p</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>0.007</td>
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<td>Mobile without aids or stick</td>
<td>% (N)</td>
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<tr>
<td>On admission</td>
<td></td>
<td>69.2% (399)</td>
<td>65.5% (223)</td>
<td>72.5% (74)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>65.7% (353)</td>
<td>63.3% (197)</td>
<td>70.0% (70)</td>
<td>NS</td>
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<tr>
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<td>&lt;0.001</td>
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## Clinical outcomes: mortality, readmission rates

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<th>Diagnostic group</th>
<th>No. of patients</th>
<th>Proportion of men (%)</th>
<th>30-day in-hospital mortality (%)</th>
<th>Length of stay (days)*</th>
<th>28-day readmission (%)</th>
<th>Surgical treatment (%)</th>
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<tr>
<td>Total</td>
<td>367,796</td>
<td>45.6</td>
<td>15.6</td>
<td>8 (4–15)</td>
<td>14.9</td>
<td>37.4</td>
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</table>

### Mortality in high-risk emergency general surgical admissions

N. R. A. Symons¹, K. Moorthy¹, A. M. Almoudaris¹, A. Bottle², P. Aylin², C. A. Vincent¹ and O. D. Faiz¹

*British Journal of Surgery* 2013; 100: 1318–1325

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<th>Emergency</th>
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<td>719</td>
<td>577</td>
<td>142</td>
</tr>
<tr>
<td>Median Length of Stay (days)</td>
<td>9.0 (1-207)</td>
<td>8.0 (1-207)</td>
<td>10.0 (1-71)</td>
</tr>
<tr>
<td>In-hospital Mortality</td>
<td>43(5.9%)</td>
<td>40 (6.9%)</td>
<td>3 (2.1%)</td>
</tr>
<tr>
<td>30 day mortality (post-discharge)</td>
<td>4.5% (31/676)</td>
<td>5.2%(28/537)</td>
<td>2.2%(3/139)</td>
</tr>
<tr>
<td>30-day Readmission Rate</td>
<td>60/676(8.8%)</td>
<td>53 (9.9%)</td>
<td>6 (4.3%)</td>
</tr>
</tbody>
</table>
Clinical outcomes: Length of hospital stay

Before February 1st
12.2 Median

After February 1st
8.4 Median

>3 days

 Median LOS (admission month)

Patients admitted

Patients Discharged

Median LOS (admission month)

Patients admitted

Month:
- September 2014
- October 2014
- November 2014
- December 2014
- January 2015
- February 2015
- March 2015
- April 2015
- May 2015
- June 2015
- July 2015
- August 2015
- September 2015
- October 2015
- November 2015
- December 2015
- January 2016
- February 2016
- March 2016
- April 2016
- May 2016
- June 2016
- July 2016
- August 2016
- September 2016
- October 2016
- November 2016
Clinical outcomes: Length of hospital stay

Before February 1st

12.2 Median

After February 1st

8.4 Median

>3 days

Patients Discharged

Median LOS (admission month)

Patients admitted

- Patients Discharge
- Median LOS (admission month)
- Patients admitted
Multimorbidity

Polypharmacy

Elective vs Emergency

Intervention

Mortality | Survival
---|---
Elective | Actuarial
10/104 (9.6%) | 90.0%
P<0.048

Emergency | Actuarial
71/421 (16.8%) | 82.3%

Mortality | Survival
---|---
Medical Intervention Procedure
52/241 (21.5%) | 77.2%
12/88 (13.6%) | 85.6%
17/196 (8.7%) | 91.0%
P<0.001

Mortality | Survival
---|---
4 or less comorbidities | Actuarial
34/216 (15.7%) | 83.4%
P=NS

5 or more comorbidities | Actuarial
46/299 (15.4%) | 84.6%

Mortality | Survival
---|---
4 or less medications | Actuarial
15/109 (13.8%) | 84.5%
P=NS

5 or more medications | Actuarial
46/299 (15.7%) | 83.7%

Table 2: Factors significantly associated with increased in-hospital mortality using multivariate analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds ratio</th>
<th>IC 95% Odds ratio</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA Class III-V</td>
<td>6.54</td>
<td>1.50-28.47</td>
<td>0.012</td>
</tr>
<tr>
<td>Dependent basic ADLs</td>
<td>2.63</td>
<td>1.25-5.52</td>
<td>0.011</td>
</tr>
<tr>
<td>Heart failure*</td>
<td>2.57</td>
<td>1.02-5.01</td>
<td>0.046</td>
</tr>
<tr>
<td>Cognitive impairment**</td>
<td>2.54</td>
<td>1.19-5.44</td>
<td>0.016</td>
</tr>
</tbody>
</table>

* Heart failure diagnosed prior to admission
** Dementia or memory loss before admission
• Older patient admitted to General Surgery. Key facts
• The set up: Salford-POPS-GS
• Results: baseline characteristics and clinical outcomes
• Key messages
Key results: Older General Surgical patients

• Elective cancer/ emergency biliary disease
• 30% undergo surgery/ 50% managed non invasively
• High risk: complex medical, functional, cognitive and social issues
Older General Surgical patients

- Elective cancer/ emergency biliary disease
- 30% undergo surgery/ 50% managed non invasively
- High risk: complex medical, functional, cognitive and social issues
  - Comprehensive Geriatric Assessment
  - Targeted multiprofessional interventions
  - Patient centred care - discharge planning. EDD
Salford-POPS-GS
Proactive Service to make Surgery Safer for Older People

- Proactive, daily case finding service
- Comprehensive Assessment
- Targeted Multidisciplinary interventions
- Timely Discharge Planning

Arturo Vilches-Moraga, Jenny Fox, Alex Gomez-Quintanilla, Maevis Tan, Areej Paracha, Mohammad Moatari, Luciana Miguel-Alhambra, Molley Rowley, Angeline Price

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