Prospective Multicenter Validation of a Screening Tool to Identify Elder Abuse in the Emergency Department

USC Judith D. Tamkin International Symposium on Elder Abuse

February 2020

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Disclosures

• National Institute of Justice (2015-IJ-CX-0022)
• The John A. Hartford Foundation
• The Gordon and Betty Moore Foundation
• Geriatric Emergency care Applied Research (GEAR) network (NIA)
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John Cleese
Comedian
Outline

- ED Senior AID Tool
  - Derivation
  - Validation
- Challenges and Limitations
Epidemiology of Elder Abuse in the ED

- Prevalence in the ED
  - 7% (9/138) among cognitively intact (past year)\(^1\)
  - 6.5% (17/259) among pts consenting to abuse screen (current)\(^2\)
  - 3.6% (33/916) among pts consenting to abuse screen (current)
  - Actual prevalence of current elder abuse? 5%-10%

- During usual care, most ED elder abuse is missed:
  - Our study of 9 case of 138 pts - none identified in ED\(^1\)
  - National data – ICD-10 diagnosis of elder abuse = 0.01%\(^3\)

ED Senior AID Tool
Priorities for the Tool

• Brief, especially for patients with screen negative
• Applicable to all patients, including cognitively impaired
• Cover key domains (neglect, psych, physical, financial)
• Accurate (sensitive and specific)
• Include a physical exam for a subset of patients
• Done by ED nurses at bedside, not triage
• Leverage clinical judgement of ED nurses (not a score)
Derivation
Setting and Participants

• Single Site
  • University of North Carolina at Chapel Hill ED

• September 2015 – June 2017

• Eligibility:
  • ED patients 65+
  • English speaking
  • Not critically ill
  • Consent / LAR consent

• Screening tool administered by RNs and RAs
• Family/caregivers asked to leave room
Cognitive Assessment
- AMT4: Age, Date of Birth, Place, Year

Elder Abuse Questions
- 15 questions, covering 4 domains: neglect, psychological, physical, financial

Physical Assessment
- All patients with cognitive impairment or at assessor’s discretion based on chief complaint, caregiver behavior, appearance

Holistic Judgment
- “Do you suspect an ongoing problem of elder abuse?”
Initial cognitive assessment

- Normal
- Impaired

Supplemental cognitive assessment

Elder abuse questions

Physical assessment

Holistic judgment
"Based on the information available and the answers the patient provided, is there concern for the presence of abuse, or the potential for abuse?"

Based on:
- Cognitive assessment
- Elder abuse questions
- Physical assessment
- Observation of caregiver (if present) and consideration of chief complaint

Concern
No concern

Abbreviated Mental Test-4 (AMT4):
1. What is your age?
2. What is your date of birth?
3. What is this place?
4. What is the year?

Mini-Mental State Exam (MMSE)

Elder Abuse Questions
In the last 6 months:
- Have you needed help with bathing, dressing, shopping, banking, or meals? If yes, have you had someone who helps you with this?
  1. If yes, is this person always there when you need them?
  2. Does this person always do what you need?
  3. Has anyone tried to force you to sign papers or use your money against your will?
  4. Has anyone close to you threatened you or made you feel bad?
  5. Has anyone close to you tried to hurt you or harm you?
  6. Have you been afraid of anyone?
  7. Has anyone failed to give you the care you need to stay well?
  8. Has anyone close to you called you names or put you down?
  9. Has anyone told you that you give them too much trouble?
 10. Have you been sad or lonely often?
 11. Has anyone taken things that belong to you without your OK?
 12. Has anyone close to you drank a lot?
 13. Have you distrusted anyone close to you?
 14. Have you felt you need more privacy at home?
 15. Has anyone you count on for care giving let you down in terms of what you need to stay healthy?

Physical Assessment
Elements highly suggestive of abuse:
1. Bruising in unusual location, multiple bruises, or large bruises?
2. Burn patterns suggestive of intentional injury?
3. Patterned injuries?
4. Abrasions or lacerations suggestive of intentional injury?
5. Evidence of neglect?
Elements which may suggest abuse:
1. Evidence of dehydration?
2. Evidence of poor control of medical problems?
3. Evidence of malnutrition?
4. Swollen or tender area on palpation?
Specific circumstances:
1. Genital trauma or infection—evidence of sexual abuse?
2. Fractures concerning for abuse?
3. Current problem has been present for a long time—unusual delay in seeking medical attention concerning for abuse?
### Table 2. Characteristics of individuals identified with suspicion of abuse (n=17).

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Chief Complaint</th>
<th>Type of Abuse</th>
<th>Alleged Perpetrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>F</td>
<td>White</td>
<td>MVC, back pain</td>
<td>Psych.</td>
<td>Husband</td>
</tr>
<tr>
<td>65</td>
<td>F</td>
<td>White</td>
<td>Seizure</td>
<td>Psych.</td>
<td>Son</td>
</tr>
<tr>
<td>66</td>
<td>F</td>
<td>White</td>
<td>Wrist pain</td>
<td>Psych.</td>
<td>Husband</td>
</tr>
<tr>
<td>67</td>
<td>M</td>
<td>Black</td>
<td>Pneumonia</td>
<td>Neglect</td>
<td>Uncertain</td>
</tr>
<tr>
<td>68</td>
<td>M</td>
<td>Asian</td>
<td>Alcohol problem</td>
<td>Financial</td>
<td>Friend</td>
</tr>
<tr>
<td>69</td>
<td>F</td>
<td>Black</td>
<td>Medical problem</td>
<td>Financial</td>
<td>Nursing home</td>
</tr>
<tr>
<td>71</td>
<td>F</td>
<td>White</td>
<td>Diarrhea</td>
<td>Physical</td>
<td>Son</td>
</tr>
<tr>
<td>71</td>
<td>F</td>
<td>Black</td>
<td>Arm pain</td>
<td>Physical</td>
<td>Husband</td>
</tr>
<tr>
<td>73</td>
<td>F</td>
<td>Black</td>
<td>Anxiety</td>
<td>Physical</td>
<td>Husband</td>
</tr>
<tr>
<td>73</td>
<td>F</td>
<td>Black</td>
<td>Abdominal pain, emesis</td>
<td>Physical</td>
<td>Husband</td>
</tr>
<tr>
<td>75</td>
<td>M</td>
<td>White</td>
<td>Knee pain, alcohol</td>
<td>Physical</td>
<td>Husband</td>
</tr>
<tr>
<td>76</td>
<td>F</td>
<td>White</td>
<td>Failure to thrive</td>
<td>Physical</td>
<td>Husband</td>
</tr>
<tr>
<td>76</td>
<td>M</td>
<td>White</td>
<td>Fever, syncope</td>
<td>Physical</td>
<td>Children</td>
</tr>
<tr>
<td>77</td>
<td>F</td>
<td>White</td>
<td>Back pain</td>
<td>Physical</td>
<td>Assisted living</td>
</tr>
<tr>
<td>79</td>
<td>F</td>
<td>White</td>
<td>Shortness of breath</td>
<td>Physical</td>
<td>Wife</td>
</tr>
<tr>
<td>84</td>
<td>F</td>
<td>White</td>
<td>Stroke, aphasia</td>
<td>Physical</td>
<td>Boyfriend</td>
</tr>
<tr>
<td>≥90</td>
<td>F</td>
<td>White</td>
<td>Fall, possible UTI</td>
<td>Physical</td>
<td>Daughter</td>
</tr>
</tbody>
</table>

**Total N=259**

17 positives (7%)

#### a.
Patients with an Abbreviated Mental Test-4 (AMT4) score <4 completed the Mini-Mental State Exam (MMSE), where MMSE scores of 21-26 indicate mild impairment, 11-20 indicates moderate impairment, and ≤11 indicates severe impairment.
Table. Responses to elder abuse questions for patients who screened positive for abuse. Dark gray=positive. Light gray=refused to respond.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Psychological</th>
<th>Neglect</th>
<th>Financial</th>
<th>Physical</th>
<th>Risk Factor</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td>4</td>
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<td>5</td>
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<td>8</td>
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<td>9</td>
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<td>10</td>
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<td>11</td>
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<td>12</td>
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<td>13</td>
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<td>15</td>
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<tr>
<td>16</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plus data for 242 patients who screened negative.
<table>
<thead>
<tr>
<th>Combinations: Hand selected, including all four domains</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1: Psy-1, Neg-3, Fin-1, Ph-1</td>
<td>76 (50, 93)</td>
<td>92 (88, 95)</td>
</tr>
<tr>
<td>C2: Psy-1, Neg-3, Fin-2, Ph-1</td>
<td>76 (50, 93)</td>
<td>88 (84, 92)</td>
</tr>
<tr>
<td>C3: Psy-1, Neg-4, Fin-1, Ph-1</td>
<td>65 (38, 86)</td>
<td>94 (90, 96)</td>
</tr>
<tr>
<td>C4: Psy-1, Psy-5, Neg-3, Fin-1, Ph-1</td>
<td>88 (64, 99)</td>
<td>64 (58, 70)</td>
</tr>
<tr>
<td>C5: Psy-4, Neg-3, Fin-1, Ph-1</td>
<td>76 (50, 93)</td>
<td>95 (91, 97)</td>
</tr>
<tr>
<td>C6: Psy-1, Psy-4, Neg-3, Fin-1, Ph-1</td>
<td>82 (57, 96)</td>
<td>92 (88, 95)</td>
</tr>
<tr>
<td>Combinations: Classification and Regression Tree (CART) analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7: Psy-3, Psy-4, Neg-1</td>
<td>88 (64, 99)</td>
<td>91 (87, 95)</td>
</tr>
<tr>
<td>Combinations: Logistic regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8: Psy-3, Psy-4, Neg-1&lt;sup&gt;e&lt;/sup&gt;</td>
<td>88 (64, 99)</td>
<td>91 (87, 95)</td>
</tr>
<tr>
<td>C9: Psy-3, Psy-4, Psy-7, Neg-1, Neg-3&lt;sup&gt;f&lt;/sup&gt;</td>
<td>94 (71, 100)</td>
<td>87 (82, 91)</td>
</tr>
<tr>
<td>Combinations: Logistic regression, modified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C10: Psy-1, Psy-3, Psy-4, Neg-1&lt;sup&gt;g&lt;/sup&gt;</td>
<td>94 (71, 100)</td>
<td>90 (86, 94)</td>
</tr>
<tr>
<td>C11: Psy-1, Psy-3, Psy-4, Neg-1, Fin-1, Ph-1&lt;sup&gt;h&lt;/sup&gt;</td>
<td>94 (71, 100)</td>
<td>90 (85, 93)</td>
</tr>
</tbody>
</table>
Table. Responses to elder abuse questions for patients who screened positive for abuse. Dark gray=positive. Light gray=refused to respond.
Derivation Final Version: ED Senior AID Tool

Initial cognitive assessment

Elder abuse questions

Judgement of patient's ability to report abuse

Confident

Suspect elder abuse? “Based on all information available including the answers the patient provided, do you suspect an ongoing problem of elder abuse?”

Uncertain

Not confident

Physical assessment

Suspicion

No suspicion

Elder Abuse Questions
In the last 6 months:
1. Have you needed help with bathing, dressing, shopping, banking, or meals?
   a. If yes, have you had someone who helps you with this?
   b. If yes, is this person always there when you need them?
2. Has anyone close to you called you names or put you down?
3. Has anyone told you that you give them too much trouble?
4. Has anyone close to you threatened you or made you feel bad?
5. Has anyone tried to force you to sign papers or use your money against your will?
6. Has anyone close to you tried to hurt you or harm you?

Physical Assessment
Elements highly suggestive of abuse:
1. Bruising in unusual location, multiple bruises, or large bruises?
2. Burns patterns suggestive of intentional injury?
3. Patterned injuries?
4. Abrasions or lacerations suggestive of intentional injury?
5. Evidence of neglect?
Elements which may suggest abuse:
1. Evidence of dehydration?
2. Evidence of poor control of medical problems?
3. Evidence of malnutrition?
4. Swollen or tender area on palpation?
Specific circumstances:
1. Genital trauma or infection—evidence of sexual abuse?
2. Fractures concerning for abuse?
3. Current problem has been present for a long time—unusual delay in seeking medical attention concerning for abuse?
Derivation

Results

Predictive accuracy of resulting combination of 6 EA questions:

Sensitivity 94% (95% CI 71-100%)
Specificity of 90% (95% CI 85-93)*

*But compares accuracy of a combination of individual question items to the overall judgement by the same person. Not an independent reference standard.
Validation
Methods

Multicenter Prospective Study
  • University of North Carolina Hospitals, Chapel Hill, NC
  • Cooper University Hospital, Camden, NJ
  • University of Florida Health, Jacksonville, FL

  • May 2018 – August 2019

  • Eligibility:
    • ED patients 65+
    • English speaking
    • Not critically ill
    • LAR signed consent for patients without capacity to consent
Validation Methods

ED Senior AID tool screen

Positive Screens

Structured Social and Behavioral Evaluation + Medical Records

Negative Screens

10%  90%  

No Further Evaluation

Reference Standard (LEAD Panel)
Validation
Methods - Reference Standard

LEAD approach (Longitudinal, Expert, All Data)

Multi-disciplinary Panel
- Hospital social worker
- APS social worker
- Geriatrician
- Emergency physician w/ Geriatrics EM Fellowship training
- Emergency nurse w/ Sexual Assault Nurse Examiner training

Data
- ED provider note
- Discharge summary (for hospitalized patients)
- Social worker notes
- Structured Social and Behavioral Evaluation
Table 1. Characteristics of all study participants and those with a positive screen for elder abuse.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All patients (n=916)</th>
<th>Positive screen (n=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>504 (55.0)</td>
<td>25 (75.8)</td>
</tr>
<tr>
<td>Male</td>
<td>412 (45.0)</td>
<td>8 (24.2)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>634 (69.2)</td>
<td>27 (81.8)</td>
</tr>
<tr>
<td>Black</td>
<td>251 (27.4)</td>
<td>6 (18.2)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school or less</td>
<td>145 (15.9)</td>
<td>5 (15.2)</td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>232 (25.4)</td>
<td>8 (24.2)</td>
</tr>
<tr>
<td>Some college or technical degree</td>
<td>215 (23.5)</td>
<td>7 (21.2)</td>
</tr>
<tr>
<td>College graduate</td>
<td>146 (16.0)</td>
<td>7 (21.2)</td>
</tr>
<tr>
<td>Post-graduate education</td>
<td>176 (19.3)</td>
<td>6 (18.2)</td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent living</td>
<td>837 (91.5)</td>
<td>25 (75.8)</td>
</tr>
<tr>
<td>Assisted living</td>
<td>41 (4.5)</td>
<td>5 (15.2)</td>
</tr>
<tr>
<td>Nursing home</td>
<td>21 (2.3)</td>
<td>2 (6.1)</td>
</tr>
</tbody>
</table>
Table 3. Characteristics of individuals experiencing elder abuse based on LEAD panel judgment (n=17).

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>AMT4a</th>
<th>Psych.</th>
<th>Neglect</th>
<th>Financial</th>
<th>Physical</th>
<th>Alleged Perpetrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Husband</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Husband</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<td>Mother</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Son</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mother</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<td>Daughter</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hired Aide</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<td>Nephew</td>
</tr>
<tr>
<td>65-74</td>
<td>F</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nursing Facility</td>
</tr>
<tr>
<td>65-74</td>
<td>M</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adopted Son</td>
</tr>
<tr>
<td>75-84</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Assisted Living</td>
</tr>
<tr>
<td>75-84</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Son</td>
</tr>
<tr>
<td>75-84</td>
<td>F</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nursing Facility</td>
</tr>
<tr>
<td>75-84</td>
<td>M</td>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td>Son</td>
</tr>
<tr>
<td>75-84</td>
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<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Husband</td>
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<td>75-84</td>
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<td></td>
<td></td>
<td></td>
<td>Neighbor</td>
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<td>85+</td>
<td>F</td>
<td>4</td>
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<td></td>
<td></td>
<td>Husband</td>
</tr>
</tbody>
</table>

a. AMT4 is the Abbreviated Mental Test-4, where scores <4 indicate impaired cognition.
### Validation Reference Standard Results

**Table 4.** Performance of the ED Senior AID tool in identifying elder abuse (n=125).

<table>
<thead>
<tr>
<th></th>
<th>LEAD Panel Reference Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blinded</td>
</tr>
<tr>
<td></td>
<td>Positive</td>
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<tr>
<td>Positive</td>
<td>16</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
</tr>
<tr>
<td>Sensitivity, %, (95% CI)</td>
<td>94.1 (71.3-99.9)</td>
</tr>
<tr>
<td>Specificity, %, (95% CI)</td>
<td>84.3 (76.0-90.6)</td>
</tr>
<tr>
<td>Positive Predictive Value, %, (95% CI)</td>
<td>48.5 (30.8-66.5)</td>
</tr>
<tr>
<td>Negative Predictive Value, %, (95% CI)</td>
<td>98.9 (94.1-100)</td>
</tr>
</tbody>
</table>
Table 4. Performance of the ED Senior AID tool in identifying elder abuse (n=125).

<table>
<thead>
<tr>
<th>ED Senior AID Tool</th>
<th>Blinded</th>
<th></th>
<th>Unblinded</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Positive</td>
<td>16</td>
<td>17</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
<td>91</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>Sensitivity, %, (95% CI)</td>
<td>94.1 (71.3-99.9)</td>
<td></td>
<td>96.6 (82.2-99.9)</td>
<td></td>
</tr>
<tr>
<td>Specificity, %, (95% CI)</td>
<td>84.3 (76.0-90.6)</td>
<td></td>
<td>94.8 (88.3-98.3)</td>
<td></td>
</tr>
<tr>
<td>Positive Predictive Value, %, (95% CI)</td>
<td>48.5 (30.8-66.5)</td>
<td></td>
<td>84.8 (68.1-94.9)</td>
<td></td>
</tr>
<tr>
<td>Negative Predictive Value, %, (95% CI)</td>
<td>98.9 (94.1-100)</td>
<td></td>
<td>98.9 (94.1-100)</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Performance of the ED Senior AID tool in identifying abuse (n=125+791=916).

<table>
<thead>
<tr>
<th>ED Senior AID Tool</th>
<th>LEAD Panel Reference Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assume All Abused</td>
</tr>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Positive</td>
<td>16</td>
</tr>
<tr>
<td>Negative</td>
<td>792 (1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity, %, (95% CI)</th>
<th>Specificity, %, (95% CI)</th>
<th>Positive Predictive Value, %, (95% CI)</th>
<th>Negative Predictive Value, %, (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>2.0 (1.2-3.2)</td>
<td>84.3 (76.0-90.6)</td>
<td>48.5 (30.8-66.5)</td>
<td>10.3 (8.5-12.5)</td>
</tr>
<tr>
<td>Negative</td>
<td>94.1 (71.3-99.9)</td>
<td>99.4 (98.7-99.8)</td>
<td>48.5 (30.8-66.5)</td>
<td>99.9 (99.3-100)</td>
</tr>
</tbody>
</table>
Validation Extra Analysis
Health Care Utilization Pre and Post Case Identification
Limitations

Uncertainty in estimates of sensitivity
  • Broad confidence intervals due to small number of cases identified by LEAD panel
  • Reference standard for only 10% of negative screens, resulting in unknown reference standard for 791 patients.

Results reflect screening by research nurses (may differ from clinical nurses)

Increase in positive cases with unblinding of the LEAD panel suggests that the social worker evaluation (SSBE) may have been underpowered to identify abuse, possibly due to selection of questions or social worker culture/clinical demands
Challenges

• Requirement for signed consent:
  • Reduces prevalence.
  • Required by UNC IRB
  • Additionally, NC is mandatory reporting state and NIJ lawyers require that patient give permission before data is shared.

• Resource Intensive:
  • Study required sites with both research nurses and ED social workers.
  • Both of the planned non-UNC sites dropped out and had to be replaced.
Clinical Implications

• A screening tool which takes 90 seconds to administer can accurately identify elder abuse in the ED.

• Most cases of elder abuse in the ED cannot be identified based on chief complaint or physical findings. You have to talk to the patient.
Future Efforts

- EM-SART: Implementation effort that includes the ED Senior AID tool
- Prehospital screening tools
- The Holy Grail:
  - Cluster randomized trial of an integrated ED screening and response approach on long-term (i.e. 6-12 month) patient safety, health, and healthcare utilization.
Thank You

tplattsm@med.unc.edu
Ability of Older Adults to Report Elder Abuse:
An Emergency Department–Based Cross-Sectional Study

Natalie L. Richmond, BS, Sheryl Zimmerman, PhD, Bryce B. Reeve, PhD, Joseph A. Dayaa, BA, Mackenzie E. Davis, BA, Samantha B. Bowen, BA, John A. Iasiello, BA, Rachel Stererman, BA, Rayad B. Shams, BS, §Jason S. Haukoos, MD, MSc, Philip D. Sloane, MD, MPH, Debbie Travers, PhD, RN, Laura A. Mosqueda, MD, Samuel A. McLean, MD, MPA, and Timothy F. Platts-Mills, MD, MSc

American Geriatrics Society

• Cognitive impairment is a significant risk factor for elder abuse

• Design: Secondary data analysis describing the patient’s ability to report abuse during EA screening
Figure 1. Assessor confidence in patient ability to report abuse vs. Mini-Mental State Examination (n=27).
### Supplemental Table 3. Agreement of patient responses independently recorded by two assessors (N=125).

<table>
<thead>
<tr>
<th>Safety questions</th>
<th>% Agreement</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy-1 Has anyone close to you threatened you or made you feel bad?</td>
<td>99</td>
<td>0.93</td>
</tr>
<tr>
<td>Psy-2 Have you been afraid of anyone?</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Psy-3 Has anyone close to you called you names or put you down?</td>
<td>97</td>
<td>0.76</td>
</tr>
<tr>
<td>Psy-4 Has anyone told you that you give them too much trouble?</td>
<td>99</td>
<td>0.91</td>
</tr>
<tr>
<td>Psy-5 Have you been sad or lonely often?</td>
<td>94</td>
<td>0.87</td>
</tr>
<tr>
<td>Psy-6 Do you distrust anyone close to you?</td>
<td>98</td>
<td>0.89</td>
</tr>
<tr>
<td>Psy-7 Do you feel you need more privacy at home?</td>
<td>97</td>
<td>0.58</td>
</tr>
<tr>
<td>Neg-1 Is this person always there when you need them?*</td>
<td>97</td>
<td>0.92</td>
</tr>
<tr>
<td>Neg-2 Does this person always do what you need?*</td>
<td>97</td>
<td>0.79</td>
</tr>
<tr>
<td>Neg-3 Has anyone failed to give you the care you need to stay well?</td>
<td>98</td>
<td>0.90</td>
</tr>
<tr>
<td>Neg-4 Has anyone you count on for care giving let you down in terms of what you need to stay healthy?</td>
<td>99</td>
<td>0.88</td>
</tr>
<tr>
<td>Fin-1 Has anyone tried to force you to sign papers or use your money against your will?</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Fin-2 Has anyone taken things that belong to you without your OK?</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Ph-1 Has anyone close to you tried to hurt you or harm you?</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>RF-1 Does anyone close to you drink a lot?</td>
<td>98</td>
<td>0.91</td>
</tr>
</tbody>
</table>

### Suspicion of abuse

<table>
<thead>
<tr>
<th>% Agreement</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1</td>
</tr>
</tbody>
</table>

* These questions were asked to patients if they reported needing help and received help from someone in the past 6 months with activities including bathing, dressing, shopping, banking, and meals. N=85.
Table 3. Predictive accuracy values for elder abuse questions and for combinations of questions proposed for the final screening tool based on positive screens for suspicion of elder abuse (n=17). Psy: psychological; Neg: neglect; Fin: financial; Ph: physical; and RF: risk factor. PPV: positive predictive value; NPV: negative predictive value.

<table>
<thead>
<tr>
<th>Single Questions</th>
<th>Sensitivity (%), 95% CI</th>
<th>Specificity (%), 95% CI</th>
<th>PPV (%), 95% CI</th>
<th>NPV (%), 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy-1 Has anyone close to you threatened you or made you feel bad?</td>
<td>59 (33, 82)</td>
<td>96 (93, 98)</td>
<td>50 (27, 73)</td>
<td>97 (94, 99)</td>
</tr>
<tr>
<td>Psy-2 Have you been afraid of anyone?</td>
<td>24 (7, 50)</td>
<td>99 (96, 100)</td>
<td>57 (18, 90)</td>
<td>95 (91, 97)</td>
</tr>
<tr>
<td>Psy-3 Has anyone close to you called you names or put you down?</td>
<td>59 (33, 82)</td>
<td>97 (94, 99)</td>
<td>56 (31, 78)</td>
<td>97 (94, 99)</td>
</tr>
<tr>
<td>Psy-4 Has anyone told you that you give them too much trouble?</td>
<td>38 (15, 65)</td>
<td>98 (96, 100)</td>
<td>60 (26, 88)</td>
<td>96 (93, 98)</td>
</tr>
<tr>
<td>Psy-5 Have you been sad or lonely?</td>
<td>75 (48, 93)</td>
<td>67 (61, 73)</td>
<td>13 (7, 22)</td>
<td>98 (94, 99)</td>
</tr>
<tr>
<td>Psy-6 Do you distrust anyone close to you?</td>
<td>25 (7, 52)</td>
<td>93 (89, 96)</td>
<td>20 (6, 44)</td>
<td>95 (91, 97)</td>
</tr>
<tr>
<td>Psy-7 Do you feel you need more privacy at home?</td>
<td>25 (7, 52)</td>
<td>97 (94, 99)</td>
<td>36 (11, 69)</td>
<td>95 (92, 97)</td>
</tr>
<tr>
<td>Neg-1 Is this person always there when you need them?</td>
<td>50 (19, 81)</td>
<td>93 (84, 98)</td>
<td>36 (13, 65)</td>
<td>95 (92, 97)</td>
</tr>
<tr>
<td>Neg-2 Does this person always do what you need?</td>
<td>30 (7, 65)</td>
<td>97 (91, 100)</td>
<td>60 (15, 95)</td>
<td>91 (83, 96)</td>
</tr>
<tr>
<td>Neg-3 Has anyone failed to give you the care you need to stay well?</td>
<td>29 (10, 56)</td>
<td>96 (93, 98)</td>
<td>36 (13, 65)</td>
<td>95 (92, 97)</td>
</tr>
<tr>
<td>Neg-4 Has anyone you count on for caregiving let you down in terms of what you need to stay healthy?</td>
<td>25 (7, 52)</td>
<td>98 (95, 99)</td>
<td>44 (14, 79)</td>
<td>95 (92, 97)</td>
</tr>
<tr>
<td>Fin-1 Has anyone tried to force you to sign papers or use your money against your will?</td>
<td>12 (1, 36)</td>
<td>99 (97, 100)</td>
<td>50 (7, 93)</td>
<td>94 (90, 97)</td>
</tr>
<tr>
<td>Fin-2 Has anyone taken things that belong to you without your OK?</td>
<td>44 (20, 70)</td>
<td>94 (90, 96)</td>
<td>32 (14, 55)</td>
<td>96 (93, 98)</td>
</tr>
<tr>
<td>Ph-1 Has anyone close to you tried to hurt you or harm you?</td>
<td>24 (7, 50)</td>
<td>100 (98, 100)</td>
<td>100 (40, 100)</td>
<td>95 (91, 97)</td>
</tr>
<tr>
<td>RF-1 Does anyone close to you drink a lot of alcohol or use drugs?</td>
<td>31 (11, 59)</td>
<td>93 (89, 96)</td>
<td>24 (8, 47)</td>
<td>95 (92, 98)</td>
</tr>
</tbody>
</table>

Combinations: Hand selected, including all four domains

<table>
<thead>
<tr>
<th>Combinations: Classification and Regression Tree (CART) analysis</th>
<th>C1: Psy-1, Neg-3, Fin-1, Ph-1</th>
<th>C2: Psy-1, Neg-3, Fin-2, Ph-1</th>
<th>C3: Psy-1, Neg-4, Fin-1, Ph-1</th>
<th>C4: Psy-1, Psy-5, Neg-3, Fin-1, Ph-1</th>
<th>C5: Psy-4, Neg-3, Fin-1, Ph-1</th>
<th>C6: Psy-1, Psy-4, Neg-3, Fin-1, Ph-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%), 95% CI</td>
<td>76 (50, 93)</td>
<td>76 (50, 93)</td>
<td>65 (38, 86)</td>
<td>88 (64, 92)</td>
<td>76 (50, 93)</td>
<td>82 (57, 96)</td>
</tr>
<tr>
<td>Specificity (%), 95% CI</td>
<td>92 (88, 95)</td>
<td>88 (84, 92)</td>
<td>94 (90, 96)</td>
<td>64 (58, 70)</td>
<td>95 (91, 97)</td>
<td>92 (88, 95)</td>
</tr>
<tr>
<td>PPV (%), 95% CI</td>
<td>41 (24, 59)</td>
<td>32 (18, 48)</td>
<td>42 (23, 63)</td>
<td>15 (8, 23)</td>
<td>52 (31, 72)</td>
<td>41 (25, 59)</td>
</tr>
<tr>
<td>NPV (%), 95% CI</td>
<td>98 (96, 100)</td>
<td>98 (95, 99)</td>
<td>97 (94, 99)</td>
<td>99 (95, 100)</td>
<td>98 (96, 100)</td>
<td>99 (96, 100)</td>
</tr>
</tbody>
</table>

Combinations: Logistic regression

<table>
<thead>
<tr>
<th>Combinations: Logistic regression, modified</th>
<th>C8: Psy-3, Psy-4, Neg-1</th>
<th>C9: Psy-3, Psy-4, Neg-1, Neg-3</th>
<th>C10: Psy-1, Psy-3, Psy-4, Neg-1</th>
<th>C11: Psy-1, Psy-3, Psy-4, Neg-1, Fin-1, Ph-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%), 95% CI</td>
<td>88 (64, 92)</td>
<td>91 (87, 95)</td>
<td>94 (71, 100)</td>
<td>94 (71, 100)</td>
</tr>
<tr>
<td>Specificity (%), 95% CI</td>
<td>91 (87, 95)</td>
<td>82 (80, 91)</td>
<td>67 (82, 91)</td>
<td>30 (85, 93)</td>
</tr>
<tr>
<td>PPV (%), 95% CI</td>
<td>42 (26, 59)</td>
<td>42 (26, 59)</td>
<td>33 (20, 48)</td>
<td>24 (24, 55)</td>
</tr>
<tr>
<td>NPV (%), 95% CI</td>
<td>99 (97, 100)</td>
<td>99 (97, 100)</td>
<td>100 (97, 100)</td>
<td>100 (97, 100)</td>
</tr>
</tbody>
</table>

Predictive accuracy values for combinations of elder abuse questions are based on 'suspicion of elder abuse' responses to either question in each combination.

a. Predictive accuracy values for combinations of elder abuse questions are based on "suspicion of elder abuse" responses to either question in each combination.

b. N=259

c. N=258

d. These were asked if patients reported needing help and received help from someone in the past 6 months with activities including bathing, dressing, shopping, banking, and meals. N=85.
e. Stepwise logistic regression, p=0.1.
f. Stepwise logistic regression, p=0.2.
g. Modified C8 due to the fact that Neg-3, despite being identified by logistic regression (p=0.2), does not identify additional cases that C9 does not. Psy-7 replaced with Psy-1 due to low kappa for Psy-7 and no change in sensitivity and improved specificity with Psy-1.
h. Modified C10 in order to include the domains of elder abuse that C10 does not (financial and physical abuse).
Table 1. Characteristics of study participants (n=259)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years</strong></td>
<td></td>
</tr>
<tr>
<td>65-74</td>
<td>141 (54)</td>
</tr>
<tr>
<td>75-84</td>
<td>72 (28)</td>
</tr>
<tr>
<td>≥85</td>
<td>46 (18)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>155 (60)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>194 (75)</td>
</tr>
<tr>
<td>Black</td>
<td>62 (24)</td>
</tr>
<tr>
<td>American Indian</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>Asian</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td><strong>Hispanic ethnicity</strong></td>
<td>3 (1)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>43 (17)</td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>59 (23)</td>
</tr>
<tr>
<td>Some college or technical degree</td>
<td>53 (20)</td>
</tr>
<tr>
<td>College graduate</td>
<td>38 (15)</td>
</tr>
<tr>
<td>Post-graduate education</td>
<td>66 (25)</td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
<td></td>
</tr>
<tr>
<td>Independent living</td>
<td>136 (90)</td>
</tr>
<tr>
<td>Assisted living</td>
<td>7 (5)</td>
</tr>
<tr>
<td>Nursing home</td>
<td>3 (2)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (3)</td>
</tr>
<tr>
<td><strong>AMT4 ≤3</strong></td>
<td>25 (10)</td>
</tr>
<tr>
<td><strong>MMSE</strong></td>
<td></td>
</tr>
<tr>
<td>Not assessed</td>
<td>234 (90)</td>
</tr>
<tr>
<td>Mild impairment</td>
<td>11 (4)</td>
</tr>
<tr>
<td>Moderate impairment</td>
<td>14 (5)</td>
</tr>
<tr>
<td>Severe impairment</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

a. N=222.
b. Abbreviated Mental Test-4, where scores <4 indicate impaired cognition.
c. Mini-Mental State Evaluation, administered to patients with AMT4 scores <4. Scores of 21-26 indicate mild impairment, 11-20 indicate moderate impairment, and <11 indicate severe impairment.
### Supplemental Table 1. Sources of elder abuse questions

#### Elder abuse questions used in predictive accuracy and reliability study

<table>
<thead>
<tr>
<th>Question</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the last 6 months, have you needed help with bathing, dressing, shopping, banking, or meals?</td>
<td>Have you relied on people for any of the following: bathing, dressing, shopping, banking, or meals? (Yaffe, et al., 2008)</td>
</tr>
<tr>
<td>a. If yes, have you had someone who helps you with this?</td>
<td>Has anyone tried to force you to sign papers or to use your money against your will? (Yaffe, et al., 2008)</td>
</tr>
<tr>
<td>b. If yes, is this person always there when you need them?</td>
<td></td>
</tr>
<tr>
<td>c. Does this person always do what you need?</td>
<td></td>
</tr>
<tr>
<td>In the last 6 months, has anyone close to you threatened you or made you feel bad?</td>
<td>Have you been upset because someone talked to you in a way that made you feel shamed or threatened? (Yaffe, et al., 2008)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone close to you tried to hurt or harm you?</td>
<td>Has anyone close to you tried to hurt or harm you recently? (Neale, Hwalek, Scott, Sengstock, &amp; Stahl, 1991; M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>In the last 6 months, have you been afraid of anyone?</td>
<td>Are you afraid of anyone in your family? (M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone failed you give you the care you need to stay well?</td>
<td>Has anyone ever failed to help you take care of yourself when you needed help? (Aravanis et al., 1993)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone close to you called you names or put you down?</td>
<td>Has anyone close to you called you names or put you down or made you feel bad recently? (M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone told you that you give them too much trouble?</td>
<td>Does anyone tell you that you give them too much trouble? (Neale, et al., 1991)</td>
</tr>
<tr>
<td>In the last 6 months, have you been sad or lonely often?</td>
<td>Are you sad or lonely often? (Neale, et al., 1991; M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone taken things that belong to you without your OK?</td>
<td>Has anyone taken things that belong to you without your OK? (Neale, et al., 1991; M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>Does anyone close to you drink a lot of alcohol or use drugs?</td>
<td>Does anyone in your family drink a lot? (Neale, et al., 1991)</td>
</tr>
<tr>
<td>Do you distrust anyone close to you?</td>
<td>Do you trust most of the people in your family? (Neale, et al., 1991; M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>Do you feel you need more privacy at home?</td>
<td>Do you have enough privacy at home? (Neale, et al., 1991; M. J. Schofield and Mishra, 2003)</td>
</tr>
<tr>
<td>In the last 6 months, has anyone you count of for caregiving let you down in terms of what you need to stay healthy?</td>
<td>Has anyone ever failed to help you take care of yourself when you needed help? (Aravanis, et al., 1993)</td>
</tr>
</tbody>
</table>
Questions derived from the following validated instruments:

- Geriatric Mistreatment Scale
- Conflict Tactic Scale
- QUALCARE Scale
- Food Insecurity Access Scale
- Poverty assessment tool for primary care

Assessor were then asked to make a judgement about how likely it was the patient was being abused.