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A Role for Imaging in the Detection of Physical Elder Abuse

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Elder abuse is defined as “physical, sexual, or psychological abuse, as well as neglect, abandonment, and financial exploitation of an older person... either in a relationship where there is an expectation of trust, and/or when an older person is targeted based on age” (1). The prevalence of elder abuse has been estimated to be as high as 10% in the US, in people aged 60 and over (2–5), and many victims suffer from multiple types of abuse concurrently (6,7). Elder abuse has severe medical consequences, and has been linked to dementia, depression, and overall mortality (8). It also carries heavy financial costs, estimated at billions of dollars annually (9,10). This burden is only expected to increase in future years, reflecting the anticipated growth of the geriatric population (1). Yet despite the urgency of this problem, elder abuse continues to be deeply under-diagnosed, with as few as 1 in 24 cases of elder abuse in the US ever being reported (11,12).

The health care system, and the emergency department (ED) in particular, has been proposed as providing an important “window of opportunity” to screen patients for elder abuse (13,14). Health care providers in the ED are uniquely positioned to detect and report abuse, as they are often the only contact that victims have outside their families (4). In the closely related field of child abuse, pediatric radiologists in particular have played a major role in developing strategies and protocols to screen, diagnose, and manage at-risk patients. Imaging correlates of child abuse have been extensively characterized (15–17), and it is not uncommon for the pediatric radiologist, rather than the pediatrician or emergency physician, to raise the first alarm for abuse (17).

These advances in the field of child abuse stand in stark contrast to that of elder abuse, where, despite the potential for emergency radiologists to contribute similarly to physical abuse detection, literature suggests that they currently play virtually no role (2,18). Although elders are frequent users of EDs, accounting for 12–24% of visits (19), and often undergo imaging during their stays (20, 21), significant gaps in knowledge remain about how to utilize this imaging for the screening and diagnosis of abuse.

Several explanations have been proposed for the virtual exclusion of radiology from elder abuse evaluations. One is the particular clinical challenge associated with identifying “pathognomonic” radiographic findings for elder abuse. Authors including Lachs et al (7) and Dyer et al (22) report “a paucity of data” on imaging correlates for elder abuse, describing how conditions common in geriatric patients, including osteoporosis, under-nutrition, Vitamin D deficiency, and prolonged bed rest, can render elders’ bones brittle and prone to fractures. As a result, an injury resulting from abusive trauma (such as a direct blow) can look very similar to one resulting from minimal trauma in the context of geriatric pathology (such as a fall from standing in an osteoporotic patient); how to reliably distinguish between the two remains an active clinical question.

This lack of evidence-based imaging correlates for abuse has also posed an obstacle to designing training curricula on elder abuse for students, residents, and continuing medical education. Rosen et al (2016) described how radiologists receive neither formal nor informal training in elder abuse identification (13), which stands in stark contrast to the rigorous training almost all describe in recognizing child abuse. In the absence of specific lesions that radiologists can be taught to recognize as “flags” for elder abuse, it appears that most radiology programs have chosen to omit the topic until better evidence is available. As a result, radiologists reported feeling even less prepared and qualified to provide meaningful insights on cases with concern for abuse when they did arise, and consistently voiced a desire for increased instruction on the topic.

Recently, groups including Wong et al (2016) and Lee et al (2018) have explored ways in which radiologists can contribute to elder abuse detection despite these ongoing gaps in knowledge (21). Both groups report that the radiographic finding of a “mechanism mismatch,” that is, an injury or fracture pattern inconsistent with the mechanism being described by the patient or their caregivers, is a critical finding that should trigger a further work-up for physical abuse. In pediatrics, this is a mainstay of child abuse assessment. Pediatric radiologists pay close attention to the reported mechanism of injury, along with the child’s developmental stage, and consider whether the observed injury pattern is consistent with both the mechanism being described and what is developmentally feasible for the child’s age.

Several factors constrain clinicians’ ability to adapt this “mechanism mismatch” strategy for the elder population. First, the corollary of developmental stage in older adults is functional or ambulatory status, which can vary widely between two patients of the same age. Without reliable age-related milestones from which to infer it, communication between frontline clinicians and radiologists becomes all the more important in documenting and passing on information about functional status. However, this communication commonly does not occur in clinicians caring for elder patients in the ED, leaving critical information missing from abuse assessments.

While there are multiple constraints to the communication of information between clinicians and radiologists in a busy ED workflow (21), a major factor appears to be the currently limited conceptualization of radiologists’ capacity to contribute to elder abuse evaluation. Lee et al (2018) conducted interviews with experienced radiologists, as well as frontline

emergency physicians, geriatricians, and pediatricians, and found a pronounced difference in the workflow of abuse assessment between pediatrics and geriatrics. In pediatrics, imaging was seen as a critical piece of the assessment; thus, pediatric radiologists generally reported open and two-way communications with frontline providers, on topics including injury mechanism, developmental stage, living situation, family dynamics, and degree of suspicion.

By contrast, when it came to elders, the responsibility for recognizing concern for abuse was understood to lie almost solely with frontline clinicians. Geriatricians and emergency physicians stated that they would consult radiologists to confirm or rule out diagnoses, but would rarely think of them as a source of new information or clinical insight. As a direct consequence of this perception, the majority of radiologists surveyed reported that they had never been asked to read an image for concern for abuse; moreover, they described the clinical communications they did receive from frontline providers, especially the histories on imaging requisitions, as extremely minimal and incomplete, particularly regarding the patient's mechanism of injury and functional status. As a result, they generally felt ill-equipped to comment on whether a patient's injuries pointed to a potential mechanism mismatch.

The limited way in which radiologists' contribution is viewed and valued within the elder abuse detection effort is both a consequence and a potential contributor to the lack of knowledge about imaging findings of elder abuse. On the one hand, it is unsurprising that in the absence of evidence-based imaging correlates for elder abuse, a workflow has developed in which radiologists occupy a much more peripheral place than their counterparts in pediatrics. At the same time, once this perception has become widespread and reified in medical culture, it will continually shape communication between radiologists and front-line clinicians, ensuring that information conveyed on imaging requisitions remains minimal and shallow, and continually limiting the contribution that radiologists can make to an abuse assessment. Furthermore, this has significant implications for future research; without being asked to read images for concern for abuse, radiologists can have no opportunity to collate and analyze such cases to identify imaging patterns, and the possibility of advancement in the field of *developing* imaging-based correlates for elder abuse is diminished. In short, the relegation of radiology to a minor role in elder abuse assessment may constitute a kind of self-fulfilling prophecy; their exclusion from critical communications in the ED workflow limits both their immediate and potential contributions to the effort.

We therefore propose a two-pronged approach to expanding and optimizing the role of radiologists in elder abuse detection. First, ongoing research must continue to seek definitive imaging correlates of elder abuse. Given the challenges of distinguishing abusive injuries from those resulting from common geriatric pathologies, large numbers of cases will be needed to recognize specific injury and fracture patterns that should spark concern on the part of radiologists. Moreover, because of the limited way in which such concern is documented and communicated at present, it will be beneficial to consider other methods of identifying relevant cases to analyze; for example, elderly patients presenting as victims of assault, although not necessarily tagged as victims of abuse, may serve as a useful initial proxy for patients who have suffered physical abuse. These findings can help to describe

evidence-based, specific imaging correlates of elder abuse, which can in turn be incorporated into radiology training curricula.

In tandem with this effort, cultural and practical modifications to current ED workflows are also necessary to enable radiologists to contribute meaningfully to elder abuse detection. Specifically, we must aim to improve communication between frontline clinical teams and radiologists, ensuring that the latter consistently receives the necessary patient history to evaluate a case of abuse. New clinical practices can urge frontline clinicians to consider imaging as a source of potential insight in an elder abuse assessment, rather than relying solely on bedside evaluation, and especially emphasize the value of providing information about injury mechanism and functional status on imaging requisitions. Furthermore, clinicians and radiologists should be encouraged to discuss any concerns or suspicion of elder abuse in real time; electronic medical records can be used to facilitate and support this cultural shift.

These strategies are only first steps towards integrating radiologists into a complex and multidisciplinary elder abuse detection effort. As in the field of child abuse, this effort also includes emergency medical technicians, social workers, police officials, law practitioners, and others; the more that radiologists are incorporated into abuse assessments and collaborate with these different fields, the more that they can develop and adapt bodies of knowledge that are useful for each interaction. In this way, as radiologists gain experience with elder abuse cases, our hope is they will be increasingly empowered to build new strategies and tools for elder abuse detection and management.

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References

1. Connolly M, Brandl B, Breckman R. The elder justice roadmap: a stakeholder initiative to respond to an emerging health, justice, financial and social crisis [Internet] Department of Justice.; 2014 Available from: <https://www.justice.gov/file/852856/download>
2. Rosen T, Hargarten S, Flomenbaum NE, Platts-Mills TF. Identifying Elder Abuse in the Emergency Department: Toward a Multidisciplinary Team-Based Approach. *Ann Emerg Med*. 2016;68(3):378–82. [PubMed: 27005448]
3. Burnes D, Pillemer K, Caccamise PL, Mason A, Henderson CR, Berman J, et al. Prevalence of and Risk Factors for Elder Abuse and Neglect in the Community: A Population-Based Study. *J Am Geriatr Soc*. 2015 9;63(9):1906–12. [PubMed: 26312573]
4. Touza Garma C. Influence of health personnel's attitudes and knowledge in the detection and reporting of elder abuse: An exploratory systematic review. *Psychosoc Interv*. 2017 8 1;26(2):73–91.
5. Cooper C, Selwood A, Blanchard M, Walker Z, Blizard R, Livingston G. Abuse of people with dementia by family carers: representative cross sectional survey. *BMJ*. 2009 1 22;338(jan22 2):b155–b155.

6. Acierno R, Hernandez MA, Amstadter AB, Resnick HS, Steve K, Muzzy W, et al. Prevalence and Correlates of Emotional, Physical, Sexual, and Financial Abuse and Potential Neglect in the United States: The National Elder Mistreatment Study. *Am J Public Health*. 2010 2;100(2):292–7. [PubMed: 20019303]
7. Lachs MS, Pillemer K. Elder abuse. *Lancet Lond Engl*. 2004 10 2;364(9441):1263–72.
8. Lachs MS. The Mortality of Elder Mistreatment. *JAMA*. 1998 8 5;280(5):428. [PubMed: 9701077]
9. MetLife Mature Market Institute, The National Committee for the Prevention of Elder Abuse, The Center for Gerontology at Virginia Polytechnic Institute and State University. Broken Trust: Elders, Family & Finances [Internet]. 2009 Available from: <https://www.metlife.com/assets/cao/mmi/publications/studies/mmi-study-broken-trust-elders-family-finances.pdf>
10. National Center on Elder Abuse. Research: Statistics/Data. [Internet]. Available from: <https://ncea.acl.gov/whatwedo/research/statistics.html#42>
11. Yaffe MJ, Wolfson C, Lithwick M. Professions show different enquiry strategies for elder abuse detection: Implications for training and interprofessional care. *J Interprof Care*. 2009 11 1;23(6): 646–54. [PubMed: 19842958]
12. Heyborne RD. Elder Abuse: Keeping the Unthinkable in the Differential. *Acad Emerg Med*. 2007 6 1;14(6):566–7. [PubMed: 17535979]
13. Rosen T, Bloemen EM, Harpe J, Sanchez AM, Mennitt KW, McCarthy TJ, et al. Radiologists' Training, Experience, and Attitudes About Elder Abuse Detection. *AJR Am J Roentgenol*. 2016 12;207(6):1210–4. [PubMed: 27732066]
14. Kahan FS, BE Paris BE. Why elder abuse continues to elude the health care system. *Mt Sinai J Med N Y*. 2003 1;70(1):62–8.
15. Kleinman PK, editor. Diagnostic imaging of child abuse. Third edition Cambridge, United Kingdom; New York: Cambridge University Press; 2015 730 p.
16. Offiah A, van Rijn RR, Perez-Rossello JM, Kleinman PK. Skeletal imaging of child abuse (non-accidental injury). *Pediatr Radiol*. 2009 5;39(5):461–70. [PubMed: 19238374]
17. Section on Radiology. Diagnostic Imaging of Child Abuse. *PEDIATRICS*. 2009 5 1;123(5):1430–5. [PubMed: 19403511]
18. Cooper C, Selwood A, Livingston G. Knowledge, Detection, and Reporting of Abuse by Health and Social Care Professionals: A Systematic Review. *Am J Geriatr Psychiatry*. 2009 10;17(10): 826–38. [PubMed: 19916205]
19. Samaras N, Chevalley T, Samaras D, Gold G. Older Patients in the Emergency Department: A Review. *Ann Emerg Med*. 2010 9;56(3):261–9. [PubMed: 20619500]
20. Murphy K, Waa S, Jaffer H, Sauter A, Chan A. A Literature Review of Findings in Physical Elder Abuse. *Can Assoc Radiol J*. 2013 2;64(1):10–4. [PubMed: 23351969]
21. Wong NZ, Rosen T, Sanchez AM, Bloemen EM, Mennitt KW, Hentel K, et al. Imaging Findings in Elder Abuse: A Role for Radiologists in Detection. *Can Assoc Radiol J J Assoc Can Radiol*. 2017 2;68(1):16–20.
22. Dyer CB, Connolly M-T, McFeeley P. The Clinical and Medical Forensics of Elder Abuse and Neglect [Internet]. National Academies Press (US); 2003 [cited 2018 Jan 13]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK98800/>
23. Joubert L, Posenelli S. Responding to a “window of opportunity”: the detection and management of aged abuse in an acute and subacute health care setting. *Soc Work Health Care*. 2009;48(7): 702–14. [PubMed: 20182983]