

## Brief Report

# Documentation of Dual Sensory Impairment in Electronic Medical Records

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## Abstract

**Purpose of the Study:** To examine the documentation of sensory impairment in the electronic medical records (EMRs) of Veterans with both hearing and vision losses (dual sensory impairment [DSI]).

**Design and Methods:** A retrospective chart review of the EMRs of 20 patients with DSI was conducted. Providers' documentation of the presence of sensory impairment, the use of assistive technology during clinical appointments, and the content of notes mentioning communication issues were extracted from each chart note in the EMR for the prior 6 years.

**Results:** Primary care providers documented DSI in 50% of EMRs, vision loss alone in 40%, and hearing loss alone in 10% of EMRs. Audiologists documented vision loss in 50% of cases, whereas ophthalmologists/optometrists documented hearing loss in 15% of cases. Examination of two selected cases illustrates that care can be compromised when providers do not take note of sensory impairments during planning and provision of clinical care.

**Implications:** Sensory impairment is poorly documented by most providers in EMRs. This is alarming because vision and hearing affect patient–physician communication and the use of medical interventions. The results of this study raise awareness about the need to document the presence of sensory impairments and use the information when planning treatment for individuals with DSI.

**Key Words:** Hearing impairment, Vision impairment, Interdisciplinary communication, Electronic medical records, Sensory disorders

The prevalence of concurrent hearing and vision impairment (dual sensory impairment [DSI]) is between 11% and 20% among individuals older than 80 years (Caban, Lee, Gómez-Marín, Lam, & Zheng, 2005; Swenor, Ramulu, Willis, Friedman, & Lin, 2013). DSI has negative psychosocial, psychological, and functional consequences (Crews & Campbell, 2004; Raina, Wong, & Massfeller, 2004) and leads to increased risk of mortality (Gopinath et al., 2013).

As is typical for older individuals, multimorbidity is common among those with DSI (Marengoni et al., 2011) and thus well-coordinated care across multiple providers is critical. Unfortunately, care coordination is often fragmented (Anderson & Knickman, 2001; Georgiou, Marks, Braithwaite, & Westbrook, 2013), despite awareness of its importance and knowledge that

patients have concerns about system-based issues, such as wait-time for referrals, poor continuity of care, difficulties coordinating multiple appointments and communicating with providers, and complications related to polypharmacy (de Stampa et al., 2013; Noël, Frueh, Larme, & Pugh, 2005).

Electronic medical records (EMRs) can facilitate care coordination by providing immediate and remote access to the entire patient record (Goldberg, Kuzel, Feng, DeShazo, & Love, 2012). Some health care professionals report EMRs do enhance overall patient care (Goldberg et al., 2012) although they are considered less useful for between-site care coordination because of poor communication and nonstandardized practices (Hysong et al., 2011; O'Malley, Grossman, Cohen, Kemper, & Pham, 2010).

The presence of impaired hearing and/or vision should be taken into consideration during intervention planning because these can negatively impact clinical interactions, satisfaction with medical encounters, and the ability to use many interventions (Iezzoni, O'Day, Killeen, & Harker, 2004; O'Day, Killeen, & Iezzoni, 2004). However, these impairments are often incorrectly documented or undocumented in medical charts (Halpin, Iezzoni, & Rauch, 2009; Källstrand-Ericson & Hildingh, 2009) and thus are likely not taken into account during planning.

The extent to which DSI is documented in EMRs within the Veterans' Affairs (VA) health care system is unknown. The purpose of this study was to examine this matter using a retrospective chart review of the EMRs of Veterans with DSI who had received care at the Portland Veterans' Affairs Medical Center (PVAMC).

## Methods

The protocol received Institutional Review Board approval from the PVAMC. Only deidentified information was stored in an excel spreadsheet.

## Participants

The EMRs of 20 individuals with DSI were reviewed. These EMRs were selected as follows. A VA data warehouse was used to identify 100 Veterans who had seen a health care provider at the PVAMC between 2007 and 2012 and who had received hearing aids from the PVAMC Audiology Clinic and treatment from the PVAMC optometry or low-vision clinics within the past 5 years. The Computerized Patient Record System was then used to identify the first 20 of these 100 Veterans who had a three-frequency pure tone average (mean of thresholds at 500, 1,000, and 2,000 Hz) poorer than 25 dB hearing loss in both ears, best-corrected vision in the better eye between 20/60 and 20/1250, and chart notes from more than three PVAMC providers. See Table 1 for details about each case.

## Procedure

The primary author reviewed each chart note from the prior 6 years for all 20 selected EMRs. The relevant content of each note was documented in an excel spreadsheet (see Table 2 for details). When questions arose, the opinion of the second author was sought. Review of each EMR took between 1 and 3 hr to complete. In addition, two cases were selected for in-depth description to illustrate the variability in provider use of information about sensory impairments during clinical care planning and provision.

## Results

The number of EMRs in which sensory impairment was documented is reported subsequently, as are descriptions of two selected cases.

### Documentation of Sensory Impairment

Primary care providers documented DSI in 50% of cases (10/20 EMRs), vision loss alone in 40% of cases (8/20

EMRs), and hearing loss alone in 10% of cases (2/20 EMRs). Audiologists documented vision loss in 50% of cases (10/20 EMRs), whereas ophthalmologists/optometrists documented hearing loss in 15% of cases (3/20 EMRs). Recall that the Veterans in all 20 cases had clinically diagnosed DSI.

## Illustrative Cases

Case 1 was a male Veteran aged 73 years with a mild bilateral hearing loss and best-corrected visual acuity of 20/1200 (subject 13 in Table 1). The Primary care medical history documented that the patient was legally blind and had been referred to audiology because of reported hearing difficulties. The audiology service notes documented that the patient had macular degeneration and was legally blind, that an assistive vision device had been used during hearing-aid instruction, and that the patient had concerns about his own safety because he could not see and hear properly. Optometry clinic notes listed both hearing loss and vision loss as diagnosed conditions. A VA community health clinic note stated that hearing and vision impairments were potential barriers to the patient's treatment, rehabilitation, and learning, and an emergency department admission note documented that the patient had bilateral hearing aids.

Case 2 was a male Veteran aged 91 years with moderate bilateral hearing loss and best-corrected visual acuity of 20/300 (subject 9 in Table 1). The patient's primary care medical history listed the presence of more than 30 conditions, including diabetes, cardiac dysrhythmia, hypertension, headaches, and depression. Vision disorders (cataract and glaucoma) were also listed, but hearing impairment was not. The audiology service notes stated that the patient had hearing difficulty "in most situations," that he was unable to manage his hearing aids and that a caregiver had been instructed on hearing-aid handling and maintenance. The presence of vision loss was not mentioned despite the fact this may partly explain why the patient could not manage his hearing aids. The optometry clinic notes documented the presence of numerous medical conditions, but not hearing impairment. They also documented that the patient had been provided with a low-vision talking watch but had been unsuccessful with it because he could not understand its output. A chart note from the patient's diabetes management care group stated that "psychological and cognitive barriers were impeding the patient's success in the group." A chart note by the patient's social worker mentioned that "the patient is often a passive participant in social activities, and would rather engage in one-on-one conversation." A VA telehealth telephone operator noted that it was necessary to "speak up when speaking on the telephone with the patient."

## Discussion

The data indicate that routine documentation of sensory impairment by providers is inconsistent. Sensory impairments are often not listed as conditions on medical history forms and even clinicians whose role is to care for individuals

**Table 1.** Age, Gender, Hearing Sensitivity, and Best-Corrected Visual Acuity in the Better Eye for Each Case

	Age (years)	Gender	Right ear PTA <sup>a</sup> (dB) HL	Left ear PTA (dB) HL	Best corrected visual acuity
S1	70	M	45.0	53.3	20/80
S2	86	M	66.6	61.6	20/100
S3	86	M	33.3	41.6	20/400
S4	81	M	45.0	55.0	20/400
S5	61	M	43.3	38.3	4/225
S6	90	M	51.6	51.6	4/350
S7	86	M	36.6	31.6	20/300
S8	88	M	70.0	76.6	20/400
S9	91	M	55.0	56.6	20/300
S10	85	M	56.6	65.0	4/120
S11	76	M	48.3	51.6	20/300
S12	90	M	60.0	61.6	20/1200
S13	73	M	30.0	30.0	20/350
S14	87	M	53.3	53.3	20/300
S15	85	M	55.0	73.3	20/300
S16	86	M	90.0	55.0	20/250
S17	98	M	53.3	58.3	20/200
S18	80	M	58.3	70.0	20/100
S19	89	M	46.6	58.3	20/200
S20	91	M	45.0	48.3	20/150

Note: HL, hearing loss.

<sup>a</sup>Pure tone average (mean of thresholds at 500, 1,000, and 2,000 Hz). A PTA of ≤20 dB HL is considered clinically normal.

**Table 2.** Summary of Information Extracted From EMRs by Clinic Type

Audiology service	Optometry/ophthalmology	All other disciplines
Degree and type of hearing loss	Degree and type of vision loss	Whether hearing and/or vision loss were documented in clinic case history form
Use of hearing aids	Use of vision aids	Documentation of hearing and/or vision loss independent of case history
Provision of vision aids during clinical appointments	Provision of listening aids during clinical appointments	Comments relating to vision loss, hearing loss and communication
Documentation of vision loss as a consideration for the rehabilitation and management care plan	Documentation of hearing loss as a consideration for the rehabilitation and management care plan	

with hearing loss or vision loss are uneven in their reporting of sensory impairments outside of their specific field of practice. However, as illustrated by the first case study, in some instances, providers are sensitive to the presence of sensory impairments, and as a result, individuals receive care coordinated around these impairments.

The second case study, on the other hand, shows how patient care can be compromised when sensory impairment is not taken into consideration. This patient was provided with a talking watch he could not hear, his social worker considered him to be passive during social activities, the coordinator of his diabetes care group attributed his lack of success in the group to psychological and cognitive barriers, and he was expected to communicate via the telephone for telehealth encounters. Had this patient's providers been more cognizant of his DSI, they may have made different choices and/or drawn different conclusions. Specifically, although the patient may indeed have had cognitive and psychological

barriers, it is highly probable that his DSI exacerbated these problems. Further, telehealth encounters could have been conducted via E-mail rather than telephone (or not at all); the patient could have been provided with a watch that had a large face, bolded numbering, and a vibrating alarm rather than one that talked; and the patient's social worker and diabetes group coordinator could have checked the functioning of the patient's hearing aids and made simple modifications to the meeting rooms to improve the acoustic environment before each meeting. All of these are low-cost-effective accommodations that could easily have been implemented.

It is unclear why hearing loss and vision loss were taken into consideration in Case 1 but not in Case 2. The patient in Case 2 had more severe sensory impairments than the patient in the Case 1, thus patient need does not seem to be the explanation. A possibility is that the patient in the second case was responsible for informing his providers that he had DSI and thus he received the support he required.

It is unfortunate that patients need to advocate for themselves in this matter, particularly because older patients often have a low perception of control over their health (Ruggiano, Shtompel, & Edvardsson, 2014), and thus may not feel empowered to do so. However, until medical professionals become cognizant of the potential impacts of sensory loss on medical encounters and care, self-advocacy may be necessary.

It is important for sensory impairments to be taken into consideration during medical encounters because vision and hearing greatly affect patient–physician communication and the understanding and ability to use medical interventions (Safeer & Keenan, 2005). As the population ages, the presence of multimorbidities will increase and so will the number of patients with DSI receiving care from multiple providers. EMRs should be an efficient way to share information, including the presence of sensory impairment, between providers. To achieve this, however, health care providers must become more aware of the presence and impacts of sensory losses.

### Limitations

The study has some limitations as follows: First, the data were extracted from written chart notes. The content of undocumented oral communications between providers and patients, and the providers' thought processes, is unknown. It is possible that discussion about hearing and vision losses did take place. Nonetheless, without written documentation of sensory losses, each provider must (but may not) obtain this information independently. Second, only one researcher reviewed the EMRs in detail, with periodic input from the second researcher, thus raising the possibility of bias. In spite of this limitation, the data call attention to the issue of DSI and the implications it can have for provision of care.

It is hoped that the results of study will raise awareness about the need to document sensory impairments in EMRs and to take sensory loss into consideration when planning treatment.

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