
Balance Lab Templates and Reports

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Cleveland VAMC
Audiology Balance Lab

This presentation was supported by the resources of the Cleveland Louis Stokes VA Medical center. The presenter gratefully acknowledges the assistance of the professional and support staff in the completion of this project.

Special thanks go to Robert Elshaw, our Clinical Applications Coordinator who could read my mind.

Also special thanks to Darlene Moenter-Rodriguez our service chief who never stopped believing I really was working on my templates. It was just a coincidence that I needed to do it during the walk-in clinic.

Some obstacles to running an effective balance laboratory include;

- The unknown effects of multiple medications on the exams
 - Over-referrals from PCP's who do not screen for common causes of balance disorders
 - The extraordinary time it takes to write a thorough balance exam report
 - The inability to interface your lab equipment report generating programs with the medical center network
 - Referring PCP's and other professional staff are unaware of audiologists' roles in balance and the balance terminology.
-

Consulting Pharmacy

- Veterans often present multiple comorbidities requiring multiple medications
 - While many of these medications have side effects of “dizziness”, it would be useful to understand the effects of the medication on the specific balance control physiological mechanisms we assess
 - A good pharmacy report gives insight during oculomotor, vestibular, and postural control testing.
-

Inpatient Pharmacy Consult from Audiology Balance Clinic:

ZZ CAVALIER, CLEVELAND E, has been referred to the Audiology Balance Clinic with complaints of dizziness. The clinic assesses the integration of somatosensory, visual, and vestibular input elements, as well as motor output elements which produce musculoskeletal postural realignments. This consult has been placed to Pharmacy service to conduct a chart review for this patient prior to the scheduled clinic appointment on

Please focus on identifying medications in this patient's profile that produce the following adverse drug reactions (ADR's):

- Vestibulotoxicity (NOT Ototoxicity)
- Dysmetria
- Nystagmus/compromised Vestibular-Ocular reflex
- Oculomotor Effects
- Sedation
- Orthostasis

Please also identify medications that indicate that patient may have peripheral neuropathy.

Once the chart review is complete, a note will be entered in CPRS with the requested information.

Other Inpatient Pharmacy Consult:

Consulting Audiology for the Dizzy Patient

- Attempts are made to limit the referrals of dizzy patients to those in need of clinical correlations to symptoms
 - Otolaryngology requires the patient be seen by audiology prior to their initial visit.
 - The primary care providers (PCP's) are encouraged to send their multifactorial fall risk elderly directly to physical therapist.
-

What is the purpose for this audiology referral?

Obtaining a hearing aid due to hearing loss

Hearing loss due to medical condition (i.e., ear infection, past ear surgeries)

Sudden onset hearing loss

Tinnitus

Dizziness

* Normal age-related balance changes should be excluded. Also, *
* please rule out orthostatic Hypotension and medicine interactions *
* as cause of the dizziness. If you wish to continue, you will *
* have the choice of submitting the consult to either Audiology or *
* Physical Therapy. *

*****OPTION 1 - AUDIOLOGY CONSULT*****

IF clinical correlations for differential diagnosis are needed,
CONTINUE SENDING THE CONSULT TO AUDIOLOGY. This veteran should
be experiencing either dizziness, vertigo, unsteadiness,
pre-syncopal episodes, or light-headedness of unknown
etiology and possible progressive or fluctuating hearing loss
is evident.

*****OPTION 2 - PHYSICAL THERAPY CONSULT*****

IF the veteran has unsteadiness or dizziness (NOT true vertigo)
from a pre-existing diagnosed condition which you are
managing, and the disorder is limiting the veteran's
daily activities, the CONSULT SHOULD BE SENT TO
EITHER BRECKSVILLE OR WADE PARK PHYSICAL THERAPY.

Ear pain/fullness

Hearing aid problem

The Domoracki-Elshaw Balance Report Templates

Sample template format

d. Electronystagmography abnormal;

1. "Electronystagmography (ENG) was performed to assess the integrity of the right and left peripheral vestibular systems individually and the function of the ocular-motor system.

THE ENG WAS ABNORMAL

This veteran's ENG was characterized by the following abnormalities: <open field>

The following results were within normal range: <open field>

Judgement of veteran attentiveness and cooperation: <open field>

Diagnostic impressions: <open field>"

2. Caloric summary yes/no

3. Caloric summary yes

"left warm caloric SPV <open field>

right warm caloric SPV <open field>

right cool caloric SPV <open field>

left cool caloric SPV <open field>

total SPV <open field>

Unilateral Weakness <open field>

Directional Preponderance<open field>"

4. "Other: <open field>"

CPRS Balance Templates

Reminder Dialog Template: BALANCE EVALUATION (T)

This veteran was referred with complaints of:

The following assessments were performed:

- BALANCE HANDICAP INVENTORY:
- CLINICAL EXAMINATION:
- AUDIOMETRICS:
- DYNAMIC VISUAL ACUITY (DVA):
- ELECTRONYSTAGMOGRAPHY:
- ROTARY CHAIR TESTING:
- POSTUROGRAPHY:
- VESTIBULAR EVOKED MYOGENIC POTENTIAL TESTING:
- AUDITORY EVOKED POTENTIAL EXAM:
- SUMMARY AND PLAN:

Visit Info Finish Cancel

This veteran was referred with complaints of:

The following assessments were performed:

<No encounter information entered>

* Indicates a Required Field

Postings
CWAD
Change...

Reminder Dialog Template: BALANCE EVALUATION (T)

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night.
There is a gradual onset off balance feeling when he walks around his

The following assessments were performed.

BALANCE HANDICAP INVENTORY.

Functional score -
 Emotional score -
 Physical score -

Total Score is 45 which indicates:

0-14 No Handicap
 16-26 Mild Handicap
 28-44 Moderate Handicap
 > 44 Severe Handicap

Other:

CLINICAL EXAMINATION-

HEAD THRUST

Head thrust to the right normal.
 Head thrust to the right abnormal
 corrective saccade to the left

Head thrust to the left normal.

Visit Info Finish Cancel

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

Postings
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Change...

Start | SmartTerm | Inbox - Microsoft Outlook | CPRS - Patient Chart | Microsoft PowerPrint - [...]

4:08 PM

Reminder Dialog Template: BALANCE EVALUATION (T)

Head thrust to the left normal.
 Head thrust to the left abnormal.

GAIT WALK
 TANDEM WALK
 FUKUDA MARCH

Fukuda march normal.
 Fukuda march abnormal.
 vet turns to the left

ROMBERG

Romberg eyes open normal.
 Romberg eyes open abnormal.
 Romberg eyes closed normal.
 Romberg eyes closed abnormal.

TRAGAL PRESSURE TEST
 PAST-POINTING
 SKEW EYE DEVIATION
 Other:

AUDIOMETRICS:
 Normal
 Abnormal
 Other:

Visit Info Finish Cancel

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

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DYNAMIC VISUAL ACUITY (DVA):

- Normal
- Abnormal

When the patient is still, the visual acuity is 20/20 . A measure of the patient's perception time (the minimal duration of stimulus) is 50 msec . The patient's visual acuity during rightward head turns is 20/25 . The patient's visual acuity during leftward head turns is 20/160 . The abnormal decrease in visual acuity during head movement while turning toward the left could suggest a left vestibular ocular reflex (VOR) or ocular motor weakness. The patient loses focus of the surrounding environment when moving at moderate speeds.

Other:

ELECTRONYSTAGMOGRAPHY:

- Normal
- Abnormal

This patient's ENG was characterized by the following abnormalities:
 Bithermal water caloric responses show left ear significant peripheral vestibular weakness (38%) Slight right beating direction fixed positional nystagmus when fixation constrained.

The following results were within normal range:
 Normal saccadic and smooth pursuit eye movements. Normal optokinetic responses to moving visual fields both directions. Negative Hallpikes (no BPPV). No gaze nystagmus with or without fixation.

Judgement of patient attentiveness and cooperation:
 vet was attentive and cooperative

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Cancel

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

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Reminder Dialog Template: BALANCE EVALUATION (T)

DIAGNOSTIC IMPRESSIONS:
left side peripheral vestibular weakness

CALORIC SUMMARY

Left warm caloric SPV:
10 deg/sec

Right warm caloric SPV:
20 deg/sec

Right cool caloric SPV:
18 deg/sec

Left cool caloric SPV:
6 deg/sec

Total SPV:

Unilateral weakness:
38% in the left

Directional preponderance:
5 % to the right

Values
 Other:

Visit Info Finish Cancel

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

Postings
CWAD
Change...

Reminder Dialog Template: BALANCE EVALUATION (T)

ROTARY CHAIR TESTING:

- Normal
- Abnormal
- Values
- Other:

POSTUROGRAPHY:

- Normal
- Abnormal

The Sensory Organization Test (SOT) resulted in the following with clinical significance:

- Normal on all conditions:
The pattern suggests the following:
- Vestibular dysfunction pattern: (5, 6 abnormal)
The pattern suggests the following:
Inability to integrate vestibular sensory information with vision and proprioception. Vet falls when other sense modalities are constricted
- Visual-Vestibular dysfunction pattern: (4, 5, 6 abnormal)
The pattern suggests the following:
- Visual preference even with incorrect visual information pattern: (3, 6 abnormal)
The pattern suggests the following:
- Visual preference with vestibular dysfunction pattern: (3, 5, 6 abnormal)
The pattern suggests the following:

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

Postings
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Change...

Reminder Dialog Template: BALANCE EVALUATION (T)

Postural control strategy analysis:
- good control strategies

Center of gravity alignment:
- normal

Automatic postural control during motor control:
- normal

Volitional postural control during adaptation test:
- good adaptation

Control over volitional sway and limits of stability:

Judgement of patient attentiveness and cooperation:

DIAGNOSTIC IMPRESSIONS
evidence of poor vestibular sensory integration

Other:

VESTIBULAR EVOKED MYOGENIC POTENTIAL TESTING:

Normal

Values

P1/N1 amplitude:
left: 120uV
right: 160uV

Latency of N1:

Amplitude ratio (33% or greater is abnormal):

Abnormal

Values

Visit Info Finish Cancel

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off

* Indicates a Required Field

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AUDITORY EVOKED POTENTIAL EXAM:

The patient was referred for:
Frequent falls

- Normal
- Abnormal
- Normal with cochlear loss
- Equivocal

The evoked waveform had very poor morphology and the responses were not repeatable in *both ears [v]. Each of the salient peaks could not be identified with confidence. Because of the poor tracing, conduction defects cannot be ruled out and imaging may help to resolve. The reasons for the poor responses include:
High artifacts due to much patient movement. He could not get comfortable

- The ABR in the other ear was:
- Data:
- Other:

Other

SUMMARY AND PLAN:

Overall, today's results suggest a left ear peripheral vestibular weakness, causing an impairment in vestibular sensory integration. Vet loses balance and falls when deprived of visual cues and a stable platform.

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This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset of

* Indicates a Required Field

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Report Preview: Unilateral vestibular weakness

Last 100 Signed Notes

- [-] New Note in Progress
 - [-] Feb 12, 09 AUDIOLOGY B...
- [-] All signed notes
 - [-] Feb 10, 09 DIABETIC RETII
 - [-] Feb 09, 09 GERIATRIC DEF
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 - [-] Jan 30, 09 REHABILITATIO
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 - [-] Jan 07, 09 OPHTHALMIC I
 - [-] Dec 31, 08 MEDICATION A
 - [-] Dec 22, 08 COMMUNITY H
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 - [-] Dec 11, 08 NEUROLOGY C
 - [-] Dec 08, 08 OPTOMETRY C
 - [-] Dec 04, 08 ANESTHESIA F
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- / Templates
- / Reminders
- Encounter
- New Note

AUDIOLOGY BALANCE EVALUATION (T) Feb 12, 2009@16:03 Domoracki, David Change...

Vst: 02/12/09 W AUDIOLOGY/TELEPHONE

This veteran was referred with complaints of: Vet claims that he is afraid he is going to fall, especially at night. There is a gradual onset off balance feeling when he walks around his house and it lasts all day.

The following assessments were performed:

BALANCE HANDICAP INVENTORY:
The Balance Handicap Inventory was administered as a tool to assess self-perceived handicap.

The results are as follows:

Total Score is 45 which indicates:
SEVERE HANDICAP

CLINICAL EXAMINATION:
The following clinical examinations were performed:

HEAD THRUST:
Head thrust to the right abnormal.
corrective saccade to the left
Head thrust to the left normal.

FUKUDA MARCH:
Fukuda march abnormal.
vet turns to the left

ROMBERG:
Romberg eyes open normal.
Romberg eyes closed normal.

<No encounter information entered>

	ZZ CAVALIER,CLEVELAND E 000-00-0023 Jul 04,1957 (51)	W AUDT Feb 12,09 15:33 Provider: DOMORACKI,DAVID	Primary Care Team Unassigned	Pt Insur	Flag	VistaWeb Remote Date		Postings CWAD
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- / Reminders
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AUDIOMETRICS:
Comprehensive hearing test shows hearing essentially within normal limits bilaterally. Speech discrimination ability is normal bilaterally and middle ear mobility is normal. The stapedial reflexes are within normal range. There is no evidence of middle or inner ear fistula during pressure changes in the ear canal.

DYNAMIC VISUAL ACUITY (DVA):
Visual acuity was assessed when the patient was still and during moderate head rotations. The rotation speed mimics typical body movements. Vestibular-ocular reflex (VOR) abnormalities or eye movement motor command abnormalities can prevent an individual from focusing on the visual environment during normal activities. During the test, the patient shakes his head at an average velocity of 100 degrees per second and a measure is taken of visual sensitivity. The recording equipment can determine the loss of sensitivity during rightward and leftward head turns.

THE DYNAMIC VISUAL ACUITY WAS ABNORMAL

When the patient is still, the visual acuity is 20/20. A measure of the patient's perception time (the minimal duration of stimulus) is 50 msec. The patient's visual acuity during rightward head turns is 20/25. The patient's visual acuity during leftward head turns is 20/160. The abnormal decrease in visual acuity during head movement while turning toward the left could suggest a left vestibular ocular reflex (VOR) or ocular motor weakness. The patient loses focus of the surrounding environment when moving at moderate speeds.

ELECTRONYSTAGMOGRAPHY:
Electronystagmography (ENG) was performed to assess the integrity of the right and left peripheral vestibular systems individually and the function of the ocular-motor system.

<No encounter information entered>

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

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- / Reminders
- Encounter
- New Note

AUDIOLOGY BALANCE EVALUATION (T) Feb 12,2009@16:03 Domoracki,David Change...

Vst: 02/12/09 W AUDIOLOGY/TELEPHONE

THE ENG WAS ABNORMAL

This patient's ENG was characterized by the following abnormalities:
 Bithermal water caloric responses show left ear significant peripheral vestibular weakness (38%) Slight right beating direction fixed positional nystagmus when fixation constrained.

The following results were within normal range:
 Normal saccadic and smooth pursuit eye movements. Normal optokinetic responses to moving visual fields both directions. Negative Hallpikes (no BPPV). No gaze nystagmus with or without fixation.

Judgement of patient attentiveness and cooperation:
 vet was attentive and cooperative

DIAGNOSTIC IMPRESSIONS:
 left side peripheral vestibular weakness

CALORIC SUMMARY

Left warm caloric SPV:
 10 deg/sec

Right warm caloric SPV:
 20 deg/sec

Right cool caloric SPV:
 18 deg/sec

Left cool caloric SPV:
 6 deg/sec

Total SPV:

Unilateral weakness:
 38% in the left

Directional preponderance:

<No encounter information entered>

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- / Reminders
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ROTARY CHAIR TESTING:
Rotary Chair testing is a passive rotational test, performed to assess both ocular-motor integrity and the vestibular ocular reflex (VOR). The veteran is seated in a motorized chair with cameras recording eye deviation. Rapid velocity steps and sinusoidal oscillations are produced while the patient's head movements are constrained. Central and peripheral vestibular function can be assessed at different body speeds by studying the eye movements.

THE ROTARY CHAIR EXAM WAS NORMAL

The saccadic, optokinetic, and smooth pursuit eye movements were normal and there was no gaze nystagmus. The patient demonstrated good visual supression of movement-induced nystagmus. Rapid rotations produced the expected eye movements when the visual field was stationary . There were no abnormalities in the vestibular ocular reflex (VOR) measures at slow and fast chair sinusoidal oscillations. The nystagmus showed normal gain, symmetry in both directions of turn, and phase relationships to head movement. Finally, the patient demonstrated normal nystagmus gain and decay during rapid increases and decreases in velocity (step velocity test).

POSTUROGRAPHY:
Computerized Dynamic Posturography (CDP) is a functional test of balance which requires the patient to remain stable under various conditions of platform and visual field motion. Somatosensory, visual and vestibular integration abilities are assessed. Also, the automatic and volitional motor coordination necessary for rapid postural changes are examined.

THE POSTUROGRAPHY EXAM WAS ABNORMAL

This patient's posturography exam was characterized by the following abnormalities:

The Sensory Organization Test (SOT) resulted in the following with clinical significance:

<No encounter information entered>

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

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- / Templates
- / Reminders
- Encounter
- New Note

AUDIOLOGY BALANCE EVALUATION (T) Feb 12,2009@16:03 Domoracki,David Change...

Vst: 02/12/09 W AUDIOLOGY/TELEPHONE

The Sensory Organization Test (SOT) resulted in the following with clinical significance:
 Vestibular dysfunction pattern:
 The pattern suggests the following:
 Inability to integrate vestibular sensory information with vision and proprioception. Vet falls when other sense modalities are constrained

Postural control strategy analysis:
 - good control strategies

Center of gravity alignment:
 - normal

Automatic postural control during motor control:
 - normal

Volitional postural control during adaptation test:
 - good adaptation

DIAGNOSTIC IMPRESSIONS
 evidence of poor vestibular sensory integration

VESTIBULAR EVOKED MYOGENIC POTENTIAL TESTING:
 Vestibular Evoked Myogenic Potential (VEMP) testing was performed to assess a portion of the otolith organs used in balance control (the saccule) along with other associated sensory and motor nerve fibers. Myogenic recordings of the sternocleidomastoid (SCM) muscles during sustained loud click and tone burst stimulation to each ear help to reveal vestibular function from each side of the head. Several hundred loud clicks are presented to each ear while the veteran maintains a specified tonic nerve activity from the SCM. The resultant right side and left side waveform peak amplitudes are compared for symmetry.

THE VEMP EXAM WAS NORMAL

The veteran demonstrated normal absolute and interear D1 and M1

<No encounter information entered>

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

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- [-] Nov 10,08 NURSING NOT
- [-] Nov 10,08 INFORMED COI
- [-] Nov 10,08 MHC PSYCHOT

- / Templates
- / Reminders
- Encounter
- New Note

AUDIOLOGY BALANCE EVALUATION (T) Feb 12,2009@16:03 Domoracki,David Change...

Vst: 02/12/09 W AUDIOLOGY/TELEPHONE

THE VEMP EXAM WAS NORMAL

The veteran demonstrated normal absolute and interear P1 and N1 latencies and amplitudes. The waveform morphology was good and reliability of the response was seen in the replications. These results suggest normal saccular function and integrity of the inferior vestibular nerve.

Values
P1/N1 amplitude:
left: 120uV
right: 160uV

AUDITORY EVOKED POTENTIAL EXAM:

The patient was referred for:
Frequent falls

Auditory Brainstem Response (ABR) audiometry was performed to assess the integrity of central auditory pathways on each side. A two channel evoked potential system was used to record ipsilateral and contralateral responses. 90 dB clicks were presented on each ear and recording electrodes were placed over the mastoids and the forehead. The salient waveform peaks and valleys signify neural activity from the cochlea, eighth nerve, low brainstem and midbrain regions.

THE ABR EXAM RESULTS WERE EQUIVOCAL AND COULD NOT RELIABLY BE INTERPRETED

The evoked waveform had very poor morphology and the responses were not repeatable in both ears. Each of the salient peaks could not be identified with confidence. Because of the poor tracing, conduction defects cannot be ruled out and imaging may help to resolve. The reasons for the poor responses include: High artifacts due to much patient movement. He could not get comfortable

SUMMARY AND PLAN:
Overall, todays results suggest a left ear peripheral vestibular weakness, causing an impairment in vestibular sensory integration. Vet loses balance and falls when deprived of visual cues and a stable platform.

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

To get a download of the Balance Report Templates;

- Contact the Clinical Application Coordinator (CAC) in your medical center
 - Have your CAC contact Robert Elshaw, the Cleveland VA CAC at 216-791-3800 ext. 3715, or cell phone 216-701-6965. Ask for the Domoracki-Elshaw Balance Report Templates
 - Have the templates added to your “progress note properties”
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