

**INTERVENTIONAL  
RESEARCH PROTOCOL TEMPLATE**  
*(HRP-503a)*

# Statistical Analysis Plan

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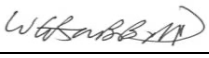
TRIAL FULL TITLE	Sphenopalatine Ganglion Nerve Block vs. Elavil for Treatment of Transformed Migraines
SAP VERSION	1
SAP VERSION DATE	8/3/2021
TRIAL STATISTICIAN	William R. Grubb, MD
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TRIAL PRINCIPAL INVESTIGATOR	William R. Grubb, MD
SAP AUTHOR(s)	William R. Grubb, MD

## 1 SAP Signatures

I give my approval for the attached SAP Sphenopalatine Ganglion Nerve Block vs. Elavil for Treatment of Transformed Migraines dated 8/3/2021


### Statistician (Author)

Name: William R. Grubb, MD

Signature:   
Date: 8/3/2021

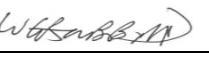
### Statistician Reviewer (As applicable)

Name: William R. Grubb, MD

Signature:   
Date: 8/3/2021

### Principal Investigator

Name: William R. Grubb, MD

Signature:   
Date: 8/3/2021

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## **1.0 Research Introduction**

### **1.1 Purpose/Specific Aims**

#### ➤ ***Purpose of study***

The purpose of this study is to compare a local anesthetic technique (sphenopalatine ganglion block) versus medical management with the traditional antidepressant Elavil for the treatment of patients suffering from transformed migraines (chronic migraines).

#### ➤ ***Objectives***

The objective is to randomize subjects who present with transformed migraine headaches into one of two treatment groups to compare the efficacy of the therapies. Subjects will receive either a sphenopalatine ganglion block with 5% lidocaine ointment into the nasopharynx or medical management with the traditional antidepressant, Elavil, to produce a reduction in the frequency and severity of the headache.

#### ➤ ***Hypotheses***

We propose that there will be a difference in the outcomes when comparing the two methods of treating transformed migraines and that one research arm will result in higher satisfaction and greater efficacy in the treatment of subjects.

Transformed migraines, also known as chronic migraines, is an illness that initially presents as episodic migraine headaches whose frequency increases in a matter of months to years. These episodic migraines transform to chronic migraines that occur every day. Accompanying the migraines can be symptoms such as photophobia,

phonophobia, nausea, and gastrointestinal distress. Preventative therapy for transformed migraines revolves around pain management and antidepressant use (8).

Patients who suffer from chronic headaches have been treated with a variety of nerve blocks for immediate relief. Among those nerve block treatments has been the sphenopalatine ganglion block.

The sphenopalatine ganglion lies posterior to the middle turbinate and maxillary sinus, anterior to the medial plate of the pterygoid process, and inferior to the sphenoid sinus and maxillary nerve. It has been reported that its sensory function is to innervate the nasal cavity linings, throat, and sinuses (1).

Nerve blocks have a role in headache therapies and have been noted to be effective in those headaches produced by the complication of post dural puncture headache after spinal or inadvertent epidural block. Furthermore, nerve blocks have been used for the treatment of cluster headaches (7). Hardebo and Elnar report aborting cluster headaches with the use of sphenopalatine ganglion block (5). Our recent review of the literature has also suggested that there is a vast variety in the methods of administration of the block, as well as a lack of support for its benefit in patients suffering from transformed migraines. A proven method of performing the block uses a cotton tip applicator to place lidocaine gel 5% in the middle posterior pharynx. This technique of allowing for transmucosal application of local anesthetics was proposed by Lebovits (6) and modified by Chan-Liao (2).

Pharmacotherapy has also been useful in the treatment of headaches. Patients who suffer from chronic migraine headaches who have been treated with antidepressant therapy report success. The traditional antidepressant Elavil, also known as amitriptyline, has been reported to be an effective antimigraine agent (3) and is one of the first-choice drugs used for migraine prophylaxis (4).

#### 1.2 Research Significance

The sphenopalatine ganglion has been identified in the literature as a potential target for the management of headaches. There are many reports of the use of the sphenopalatine block as a treatment for acute headaches, but there have been no prospective studies that evaluate the efficacy of the therapy for chronic headache therapy of the transformed type.

#### 1.3 Research Design and Methods

The design of the study consists of the randomization of subjects suffering from transformative migraine headache in one of two groups. The study is not blinded; as the participants will know which method they are being treated with because of the difference in site and nature of the nerve blocks. The randomization will be created and will assign 26 subjects into one of two groups to receive:

Group 1 – Will receive 5% lidocaine ointment to the mucosa overlying the sphenopalatine ganglion in the nasopharynx. During placement of the intranasal ointment the subjects will be monitored for standard parameters including blood pressure, heart rate, and pulse oximetry.

Group 2 – Will receive medical management with Elavil 10 mg PO qday x 1 week then 20 mg PO qday x 3 weeks.

Subjects will be seen weekly for four weeks and a fifth and final visit will take place approximately two to four weeks after the fourth visit. Safety and the assessment of adverse events will be conducted throughout the study.

At the beginning of each week, a 7-day calendar-formatted questionnaire will be distributed to the subjects (See Appendix A). Subjects will be asked to fill out the questionnaire each day for that week. This questionnaire will include the following parameters: number of daily headaches within the last 24 hours, length of the duration of the headache, duration of inactivity associated with the headache, intensity of the headache (0=no headache, 10=worst headache ever), epistaxis, nausea, or vomiting present. The subjects that are in the group receiving the 5% lidocaine will also be asked to fill out a questionnaire 20 minutes after receiving the sphenopalatine ganglion block (See Appendix B). This questionnaire will include the following: Did the SPG block relieve the headache after

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the 20 minutes. All subjects will also be asked to fill out a questionnaire during their post-therapy check-up (1 week following the first day of therapy) (See Appendix C). This questionnaire will include the following parameters: Did you modify your usual customary therapy as a result of our therapy, satisfaction with treatment 1-10 (0=not satisfied, 10=extremely satisfied). Copies of the questionnaires can be found in Appendix A, B, and C.

#### 1.4 Preliminary Data

N/A

#### 1.5 Sample Size Justification

This is a randomized, unblinded prospective study comparing two different treatments in parallel. The total sample size will be 26 patients based on power analysis; thus, each treatment group will have 13 randomized subjects. Sample size calculations were performed for an independent sample t-test using a power level of 95% at 5% significance level. Since no pilot study has ever been published comparing these treatment modalities, a  $\mu_1$  value of 4 and  $\mu_2$  value of 6 with a sigma value of 2 were used for power analysis.

#### 1.6 Study Variables

##### A. Independent Variables, Interventions, or Predictor Variables

Sphenopalatine Ganglion Block

Elavil

##### B. Dependent Variables or Outcome Measures

Headache Intensity

Number of daily headaches

Duration of headaches

Duration of inactivity associated with headaches

Epistaxis

Nausea

Vomiting

Patient Satisfaction

#### 1.7 Drugs/Devices/Biologics

The study involves the use of 2mL / 5% lidocaine gel which is dispensed as a single use item for each patient.

The drug will be applied via a hollow cotton tip applicator 2mL of 1% lidocaine.

The study involves the use of Elavil which is prescribed via pharmacy.

#### 1.8 Primary Specimen Collection

N/A

#### 1.9 Interviews, Focus Groups, or Surveys

N/A

#### 1.10 Timetable/Schedule of Events

N/A

## 2.0 Project Management

### 2.1 Research Staff and Qualifications

The study will be conducted by William Grubb MD, DDS, an Interventional Pain Management specialist and Board-Certified Anesthesiologist who has many years of experience in the treatment of chronic facial pain and headache

refractory to triptans and beta blockers. The sub-I, Brian Gerhardstein, DM, is a board-certified Neurologist with a special clinical interest in headaches. He has been medically managing patients with headaches for over a decade.

## 2.2 Resources Available

Facilities: Our research will be conducted entirely within the Anesthesiology Pain Clinic offices in the RWJ Clinical Academic Building. These clinical offices are used for outpatient clinical services and follow-up.

Medical or Psychological resources: There are no anticipated consequences as a result of this research and therefore special medical or psychological resources are unnecessary.

Research Staff Training: The study will be conducted in its entirety by the PI (William Grubb, MD, DDS). The sub-I (Brian Gerhardstein, MD) will assist with data analysis and publication.

## 2.3 Research Sites

Our research will be conducted entirely within the Anesthesiology Pain Clinic offices in the RWJ Clinical Academic Building.

## 3.0 Multi-Site Research Communication & Coordination

### 3.1 Outside Research

N/A

## 4.0 Research Data Source/s

### 4.1 Primary Data-Subjects and Specimens

Primary data endpoints will include patient provided headache intensity scores, number of daily headaches, duration of headaches, duration of inactivity associated with headaches, incidence of epistaxis, incidence of nausea, incidence of vomiting and patient satisfaction scores.

### 4.2 Subject Selection and Enrollment Considerations

#### A. Recruitment Details

Potential subjects will be identified and recruited by the PI (William Grubb, MD, DDS) during patient visits at the anesthesia pain management clinical services office.

#### B. Source of Subjects

Subjects presenting to our clinical services (anesthesia pain management) offices at RWJ.

#### C. Method to Identify Potential Subjects

During clinic visits, the PI will identify patients who present with transformative headaches despite having already received optimal medical management (including triptans and anticonvulsants).

#### D. Subject Screening

Individuals will be screened by and enrolled into the study by Dr. William Grubb.

##### Inclusion Criteria:

- Males and females ages 18-90
- Subjects who have formal medical diagnosis of transformed migraine headache
- Subjects who currently require treatment for migraine headache, but not receiving elavil
- Subjects who have received optimal stable medical management for migraines for 3 months, including triptans (Imitrex, Amerge, Relpax), and pain medications including Motrin, Excedrin, Aspirin, or Fioricet, or narcotic medications prescribed by your doctor

- Subjects who have ~~received~~ not been responding to optimal medical management for migraines including triptans (Imitrex, Amerge , Relpex ) anticonvulsants (Depakote, Lamictal, Clonopin), and/or beta-blockers such as Inderal, or Catapres

**Exclusion Criteria:**

- Patients less than 18 years of age or older than 90 years of age
- Subjects will be excluded if they are already being treated with lidocaine (patch or other vehicle) for chronic pain
- Subjects who are unwilling to participate or Cognitively impaired ~~patients~~
- Non-English speaking patients
- Untreated heart failure
- Pregnancy (females between the age of 18-50 will have pregnancy testing prior to each intervention )
- Individuals unwilling to comply with study procedures and follow-up
- Subjects who are allergic to Elavil or lidocaine
- Medical history of hypersensitivity to local anesthetics, including lidocaine

Subjects who are already being treated with lidocaine for chronic pain must be excluded due to cross mechanism of action of their ongoing treatment modality with one of the treatment arms (sphenopalatine ganglion block with 5% lidocaine gel). Patients with cognitive dysfunction must be excluded because our primary data endpoints rely on effective and precise patient feedback. Patient less than 18 years of age will be excluded from this study. There are two reasons for this. First, the patient population treated by the clinical investigators of this study are adults, not children. Second, it is not fully understood whether the pathophysiology of chronic or transformed migraines is the same in the pediatric population as that of the adult population. Non-English speaking patients must be excluded from this study as the term “headache” has markedly different interpretations across various languages and cultures. Patients who are pregnant or have untreated heart failure must be excluded due to contraindication. Finally, individuals unwilling to comply with study procedures and follow-up will be excluded in order to assure quality outcome data.

**E. Recruitment Materials**

N/A

**F. Lead Site Recruitment Methods**

N/A

**4.3 Subject Randomization**

The subjects will be assigned to a treatment arm using a randomly generated list.

**4.4 Secondary Subjects**

N/A

**4.5 Number of Subjects**

**A. Total Number of Subjects**

26

**B. Total Number of Subjects If Multicenter Study**

N/A

**C. Require Number of Subjects to Complete Research**

26



#### **D. Feasibility of Recruiting**

Recruiting is feasible as our anesthesia pain clinic offices treat patients with transformed migraine headaches.

### **4.6 Consent Procedures**

#### **A. Consent**

##### **Documenting Consent**

The informed consent process will begin after a subject has been diagnosed and is presenting for consultation for transformed migraine. Each patient will be given the informed consent document to read and consider prior to agreeing to participate. The primary investigator will answer all the subjects' questions and ensure the subject has adequate time to consider participation prior to signing the informed consent document. No study assessments, measurements or interventions will occur prior to subject signing the informed consent document.

In addition, at each encounter with the subject, the primary investigator will ask the subject if he / she is agreeable to continued study participation at the beginning of each visit.

In addition, urine pregnancy tests will be performed for all females 18-50 years of age at each visit and prior to initiation of intervention.

- **Waiver of Documentation of Consent**

N/A

- **Waiver or Alteration of Consent Process**

N/A

- (i) **Use of Deception/Concealment**

N/A

#### **B. Consent Process**

- **Location of Consent Process**

The written consent will be obtained after initial consult at the anesthesiology pain medicine clinic offices in the clinical academic building.

- **Ongoing Consent**

Continued verbal consent will be obtained at each weekly visit.

- **Individual Roles for Researchers Involved in Consent**

William Grubb, MD, DDS will be the sole individual responsible for identifying, enrolling and consenting patients for this study.

- 1. **Consent Discussion Duration**

At least 30 minutes will be dedicated to reviewing the consent with each patient. All patient questions will be addressed prior to the completion of the consent process.

- 2. **Coercion or Undue Influence**

Subjects will be reminded and reassured that they do not need to participate to receive continued treatment at the anesthesia pain management clinical offices.

- 3. **Subject Understanding**

Subjects will be given 1 week to review a copy of the protocol prior to being allowed to consent.

### **4.7 Special Consent/Populations**

#### **A. Minors-Subjects Who Are Not yet Adults**

- **Criteria for Consent of Minors**

N/A

▪ **Wards of the State**

N/A

1. **Research in NJ Involving Minors**

N/A

2. **Research Outside of NJ Involving Minors**

N/A

**Parental Permission**

N/A

▪ **Non-Parental Permission**

N/A

▪ **Assent Process**

N/A

1. **Documentation of Assent**

N/A

▪ **Non-English Speaking Subjects.**

1. **Process for Non-English Speaking Subjects**

N/A

▪ **Short Form Consent for Non-English Speakers**

N/A

**B. Adults Unable to Consent / Cognitively Impaired Adults (*for interventional studies*)**

▪ **NJ Law-Assessment of Regaining the Capacity To Consent**

N/A

▪ **Capacity To Consent**

N/A

▪ **NJ Law-Selecting A Witness**

N/A

▪ **Removing a Subject**

N/A

**4.8 Economic Burden and/or Compensation for Subjects**

**A. Expenses as a result**

There will be no economic burden or additional expenses as a result of participation in the research.

**B. Compensation/Incentives**

There be no compensation for participation in the research.

**4.9 Risks to Subjects**

**A. Description of Subject Risk**

There are few risks known or associated with participation in the research.  
They are listed below.

**B. Procedures for Risks to Embryo, Fetus, and/or Pregnant Subjects**

The protocol will require pregnancy testing prior to each intervention. Female participants between ages of 18-50 and females will be advised to avoid becoming pregnant during the study.  
Any participant who becomes pregnant during the study will be withdrawn from continuation.

**C. Risks to Non-Subjects**

There are no predicted risks to non subjects.

**D. Assessment of Social Behavior Considerations**

Patients having agreed to the procedure and known to be actively treated for psychological issues will have the opportunity to discuss participation with their mental health professional.

**Reasonably Foreseeable Risks**

Subjects may experience minor local discomfort during the SPGB procedure.

1. Bitter taste in the back of the throat.
2. Difficulty talking while procedure is taking place.
3. Difficulty eating and drinking for a few minutes to up to 2 hours after the SPGB.
4. May have blood tinged secretions from bilateral nares post procedure.
5. Blood may be seen from the nares at the end of the procedure.

There is always the potential for loss of anonymity with any clinical study; however, stringent safety measures will be in place to prevent any breeches in confidentiality.

There are no known psychological/emotional, social, legal and economic risks of harm from the sphenopalatine ganglion block.

**E. Minimizing Risks**

Risks with this study are minimal. The potential for loss of anonymity will be minimized by keeping all patient information in a locked box in the anesthesia pain management clinical offices. William Grubb, MD, DDS will be the only individual with access to this locked box where all patient information will be stored. When the patient data is converted into electronic data for data analysis following the conclusion of patient data collection, all patient information will be encrypted. Patients will always be deidentified electronically when possible.

**F. Certificate of Confidentiality**

N/A

**G. Potential Benefits to Subjects**

1. General feeling of relaxation of the neck muscles during the SPGB
2. Potential overall improvement in headaches
3. Reduction in the total amount of medications required to achieve relief of headache pain
4. Potential narcotic or barbituate sparing
5. Improvement of overall quality of life
6. Potential ability to prescribe SPGB for home use after subject is taught the technique by the investigators

**H. Provisions to Protect the Privacy Interests of Subjects**

Patients will only provide personal information to William Grubb, MD, DDS. They will not be expected to interact with any other individual for the purposes of this study.

**I. Research Team Access to Subject Data**

William Grubb, MD, DDS will be the only research team member with access to the patient data. Patient data will be stored in a locked box in the anesthesia pain management clinical offices. Once data collection is complete after 26 patients have been enrolled, William Grubb, MD, DDS will convert the data

from paper to electronic format for subsequent data analysis. Patient information will be deidentified and all information will be encrypted.

**4.10 Secondary Data – Records/Chart Reviews/Databases/Tissue Banks/etc.**

N/A

**4.11 Chart/Record Review Selection**

N/A

**4.12 Secondary Specimen Collection**

N/A

**5.0 Special Considerations**

**5.1 Health Insurance Portability and Accountability Act (HIPAA)**

N/A

**5.2 Family Educational Rights and Privacy Act (FERPA)**

N/A

**5.3 NJ Access to Medical Research Act**

N/A

**5.4 Code of Federal Regulations Title 45 Part 46 (Vulnerable Populations)**

**A. "Special" Classes Of Subjects**

- (1) *Pregnant Women: see guidance (HRP-412)* - Reviewed
- (2) *Neonates: see guidance (HRP-413)* - Reviewed
- (3) *Neonates of Uncertain Viability: see guidance (HRP-414)* - Reviewed
- (4) *Prisoners: see guidance (HRP-415)* - Reviewed
- (5) *Children: see guidance (HRP-416)* - Reviewed
- (6) *Cognitively Impaired Adults: see guidance (HRP-417)* - Reviewed

**6.0 Research Data Protection and Reporting**

**6.1 Data Management and Confidentiality**

**A.** Data analysis will occur using SPSS. The appropriate statistical test will be used to compare the various types of collected data including independent variable t-tests for primary data endpoint means.

**B.** Power Analysis:

Power analysis calculations were conducted using uA of 4, uB of 6, sigma or SD of 2, sampling ratio of 1, type I error rate of 0.05 and sample size of 26 yielding a power of 0.95.

**C.** No individual will require training as only the PI, William Grubb, MD, DDS will have access to the stored patient data. William Grubb, MD, DDS will also be the only individual handling the data. A lock and key mechanism will be used for access to the patient data. This will be in addition to all building security control measures in the clinical academic building. During conversion of paper data to electronic data, patients will be deidentified.

**D.** None

**E.** *Describe how data be handled study-wide:*

- *What information will be included in that data?* The patient responses during clinic visits are the only data that will be collected and stored.
- *Where, how, and for how long will the data will be stored?* Anesthesia pain management clinical offices, 5<sup>th</sup> floor Clinical Academic Building. Locked box. Until 26 patients have been enrolled.
- *Who will have access to the data?* William Grubb, MD, DDS
- *Who is responsible for receipt or transmission of the data?* William Grubb, MD, DDS

- *How will the data will be transported/shared?* It will not be transported or shared.

## 6.2 Data Security

Only William, Grubb, MD, DDS will have access to the data placed into storage for this clinical research trial. All data collection will be secure using a physical locked box. Only William Grubb, MD, DDS will have a key for the locked box. The locked box will always remain in the anesthesiology pain management clinical offices on the fifth floor of the clinical academic building, a building with a high degree of security. The link to the PHI will be stored separately from the study files and will be destroyed after all the data has been collected and analyzed. Once data collection is complete after 26 patients have been enrolled in this study, William Grubb, MD, DDS will convert paper data to electronic data. All information will be deidentified and encrypted when converted to electronic data. All data analysis will occur using SPSS software.

## 6.3 Data and Safety Monitoring

N/A. This study provides minimal risk.

## 6.4 Reporting Results

### A. Sharing of Results with Subjects

N/A. There will be no sharing of results with subjects.

### B. Individual Results

N/A. There will be no sharing of results with subjects.

### C. Aggregate Results

Aggregate results will be shared with all study participants pending data publication in a medical journal. All participants will be provided with a copy of the final conclusion of the study.

### D. Professional Reporting

Pending data collection, analysis and interpretation, a manuscript will be written and published in an academic medical journal.

**E. ClinicalTrials.gov Registration and Data Reporting** – changes and updates to this study will be updated on ClinicalTrials.gov after IRB approval

**NCT02090998**

## 6.5 Data Sharing

N/A

## 7.0 Data and/or Specimen Banking

N/A

## 8.0 Other Approvals/Authorizations

N/A

## 9.0 Bibliography

1. Campbell EH. Anatomic studies of the sphenopalatine ganglion and the posterior palatine canal with special reference to the use of the latter as the injection Route of Choice.
2. Chan-Liao M. On-line website: <http://www.pain-manage.org.tw/s-pain-pain05.htm>
3. Couch JR, Hassanein RS. Amitriptyline in migraine prophylaxis. Arch Neurol 1979; 36(11):695-699.
4. Evers, Stefan. Treatment of migraine with prophylactic drugs. Expert Opinion on Pharmacotherapy 2008; 9(15): 2565-2573.
5. Hardebo J, Elnor A. Nerves and vessel in the pterygopalatine fossa and symptoms of cluster headaches. Headache 1987; 27:528-532
6. Lebovits A, Howard A, Lefkowitz M. Sphenopalatine ganglion block: Clinical use in the pain management clinic. Clin J Pain 1990; 6: 131-136.

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7. Tepper SJ, Stillman MJ. Cluster Headache: Potential Options for Medically Refractory Patients (When All Else Fails). *Headache Currents* 2013; 53(7): 1183-1190.
8. "Transformed Migraine." *National Headache Foundation*. 2013. Web.  
[http://www.headaches.org/education/Headache\\_Topic\\_Sheets/Transformed\\_Migraine](http://www.headaches.org/education/Headache_Topic_Sheets/Transformed_Migraine)

#### Appendix A

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
# of daily headaches within last 24 hours							
Length of the duration of the headache (mins)							
Duration of inactivity associated with the headache (mins)							
Intensity of the headache (0=no headache, 10=worst headache ever)							
Epistaxis (blood from nose) present (Y/N)							
Nausea/vomiting present (Y/N)							

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### Sphenopalatine Ganglion Nerve Block vs. Elavil for Treatment of Transformed Migraines

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#### **Appendix B: 20 minute follow-up questionnaire**

Did the SPG block relieve the headache in the last 20 minutes?

#### **Appendix C: Asked in post-questionnaire checkup:**

Did you modify your usual customary therapy as a result of our therapy?

Rate your satisfaction with the treatment from 1-10 (0=not satisfied, 10=extremely satisfied).

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Attachment 1



Subject Initials: \_\_\_\_\_  
Date: \_\_\_\_\_  
Group: \_\_\_\_\_

	Week 1	Week 2	Week 3	Week 4
Number of daily headaches				
Length of the duration of the headaches (mins)				
Duration of inactivity associated with the headaches (mins)				
Intensity of the headaches (Rate 0-10) 0= no headache, 10= worst headache ever				
Epistaxis present (Y/N)				
Nausea present (Y/N)				
Vomiting present (Y/N)				
<b>20 minute question if applicable</b> Did the SPG block relieve current headache after the 20 minutes?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
<b>Asked in post-questionnaire checkup:</b> Did you modify your usual customary therapy as a result of our therapy?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
<b>Asked in post-questionnaire checkup:</b> Satisfaction with treatment (rate 0-10) 0=not satisfied, 10=extremely satisfied				