DOI: 10.34057/PPj.2021.40.02.2021-7-6
Pelviperineology 2021;40(3):128-133

# VAMP (vulva, anus, pelvic muscles and paraurethra) protocol for physical examination of pelvic floor in vulvodynia

Ewa BASZAK-RADOMAŃSKA[1], Jadwiga WAŃCZYK-BASZAK[2], Tomasz PASZKOWSKI[2]

[1]Terpa Clinic, Department of Gynecology, Lublin, Poland
[2]3rd Chair and Department of Gynecology, Medical University of Lublin, Poland

## ABSTRACT

Vulvodynia is a functional chronic pain disorder. The etiology is unclear, although pelvic floor muscle (PFM) dysfunction is suspected as one of the main causes of vulvar discomfort. There are no standardized techniques for the quantification of pain arising from PFM overactivity. The severity of pain can be ascertained by examining four anatomical regions. The two external regions are examined using the cotton swab test, first around the vestibule of the vulva (V), and the second around the anus (A). The two internal regions, both of which are examined bilaterally using digital palpation, include the levator ani muscles (M) and the paraurethral area (P). For simplicity, only one maximum pain score was recorded for each given area, using the numerical rating scale (NRS). The four scores are then recorded under the VAMP acronym. Three of the regions (VMP) may be painful on application of pressure in vulvodynia women. Based on these findings a physical examination schedule is proposed for women presenting with vulvodynia. Confirmation of PFMs dysfunction is essential for conservative management of pain involving pelvic floor physical therapy, general myofascial therapy and biofeedback. The introduction of the VAMP protocol for vulvodynia cases is outlined on the basis of recent literature.

**Keywords:** Gynecological examination; physical pelvic examination; pelvic floor muscles; vulvar pain; vulvodynia

## INTRODUCTION

Vulvodynia is a chronic condition involving vulvar pain of at least 3-month duration, without an identifiable cause, which may have associated pathophysiological factors, as outlined in the 2015 consensus terminology.[1] Apart from spontaneous pain, vulvodynia is vestibular pain that results from intercourse or touch and is called provoked vulvodynia (PV), or combined, as a mixed form.[1]In the general population vulvodynia is estimated to occur in 8.3%–16% of adult women at any one time and more than 25% of women at some point in their lifetime.[2,3] The etiology of vulvodynia is still unclear, although dysfunctional, overactive pelvic floor muscles (PFMs) are suspected as a source of chronic pain. Pelvic floor dysfunction is found in 80%–90% patients with vulvodynia,[4] although other chronic pain factors i.e., systemic, psychosocial, neuroproliferative, inflammatory, genetic, and central nervous system related factors may also be present.[1] It is emphasized that peripheral sensitization and psychological predisposition leads to central sensitization and chronification of pain in some patients.[3-10]

The International Urogynecological Association (IUGA)/ International Continence Society (ICS) reported on the standardization of terminology of PFM function and dysfunction. It proposes the label of overactive PFMs, when pelvic muscles do not relax, or may even contract, when relaxation is functionally needed, as during micturition or defecation.[11]

**Address for Correspondence:** Ewa Baszak-Radomańska, Terpa Clinic, Department of Gynecology, Lublin, Poland
**E-mail:** ebarad@gmail.com ORCID: orcid.org/0000-0001-7020-2298
**Received:** 29 April 2021 **Accepted:** 30 July 2021

Dysfunction of PFM in the form of overactive, non-relaxing muscles can contribute to vulvodynia, including PV, chronic urogenital pain (CUP), bladder pain syndrome (BPS), irritable bowel syndrome (IBS) and chronic pelvic pain (CPP), accounting for most chronic anourogenital pain syndromes.[1,6-10]

The bimanual pelvic examination (BPE) is part of any gynecological assessment of chronic pain patients. It encompasses an examination of vulva, vagina and internal pelvic organs, PFMs are not routinely assessed. Many scales are available to document strength, tone, and tenderness, yet all these scales are subjective and not validated.[9,12-14] As a result, quantification of PFM function is not easy. There is a lack of easy to use and reliable measurement techniques and a lack of cut-off values for pathological conditions. Furthermore, the reproducibility of testing is questionable.[6,7] Without evident and simple descriptors, they are not recommended for clinical practice.[9,14]VAMP protocol (vulva, anus, pelvic muscles and paraurethra) for PFM overactive state examination was assessed and published as a pilot study.[15] On the basis of review from the literature according to BPE requirements,[14] VAMP protocol is presented in the article.

## Physical examination for pain in PFM dysfunction

The most important associated feature of overactive PFM is pain on pressure application to the vulva, a form of localized pain, sometimes considered as referral pain.[8,16-18] Deep muscles also reproduce pain when examination is carried out internally via vaginal or rectal access.[8,11,14,18]

A Numeric Rating Scale (NRS) is a preferred instrument for the assessment of pain and has been used in 68% of studies where PFMs were examined in women presenting with pain.[14] According to the NRS, pain is graded using an 11-point numeric scale of 0 to 10, with 0 representing “no pain at all” and 10 “the worst possible pain”.[19]

The NRS was used for research purposes in the Integrated Pain Mapping and Assessment Protocol (IMAP).[8,17,18,20] IMAP evaluated pain severity in women with CUP: dysuria, BPS symptoms and vulvodynia. The IMAP consists of three areas. The first region, for the assessment of pain arising from vulva, pubis, perineal and anal area, using a Q-tip; The second, for digital assessment of pelvic floor points; and the third region, for palpation of specific points in the paraurethral area. A total of 54 points were evaluated and pain scores were recorded for research purposes.[17,18,20]

Vulvar sensitivity and pain were established on the basis of the external examination. The base of the hymenal remnant has been an important part of the diagnostic criteria for vulvodynia since first proposed by Friedrich[21] in 1987, and was an important element in the assessment of vulvar vestibulitis syndrome, although 13.8% of women with vulvodynia had no increased sensitivity on cotton swab testing.[22] Diagnosis of vulvodynia is not based only on increased vulvar sensitivity.[1,22] In addition, benefits of using the cotton swab test versus other PFM examination is unclear.[12,14,22]

According to the IMAP assessment, Q-tip pressure to the anus is not painful, even though vulvodynia patients sometimes complain of spontaneous pain in the anal area. The internal pelvic muscle pain assessment has been developed to standardize the internal examination procedure, with specific palpation points identified.[8,18] Analysis of all pain scores showed that the most reliable points for the diagnosis of CUP came from palpation of the navicular fossa of the vestibulum and urethral external meatus, the left ischial spine and right puborectalis muscle and the left paraurethral area. The diagnosis of CUP can be made reliably, on the basis of these six points, as derived from the IMAP research.[8,18] Although the IMAP successfully localizes pain in a urogenital pain cohort, it is a research tool and is time consuming because it requires precise pressure on all points, many of which are not relevant from a clinical perspective. Different schedules of physical and internal examination have been proposed in literature for the assessment of PFM status over recent years,[12,14,16] including some that have specifically focused on vulvodynia patients,[12,16] although the lack of cut-off level of pain and quite difficult protocol are the obstacles in the application to clinical practice.

## Short version of IMAP: the VAMP protocol

The VAMP protocol is a short, abbreviated version of IMAP, that needs to be evaluated, in order to simplify the pain mapping protocol for clinicians. Chronic pelvic floor pain is assessed on the basis of four anatomical regions of the pelvis; two external (using a cotton swab test) and two internal (using digital palpation to the pressure level accepted by the patient). The external regions include the cotton swab pressure of vulva at the base of the hymenal remnant (V) and anal area (A); the two internal include the pelvic muscles (M), with bilateral digital palpation of the levator ani muscle, and finally the palpation of the paraurethral area (P), as outlined in Figure 1.

Only one maximum pain score is recorded for a given area, using the NRS. Pain on cotton swab or digital pressure of three regions: VMP (with exception of A) are relevant to pelvic floor overactive dysfunction in vulvodynia women. To draw the conclusion of PFM dysfunction, a recorded VMP score cut-off ≥3 in anyone area, constitutes a PFM overactive state.[15] Although anal area is not painful on examination, it should not be overlooked.

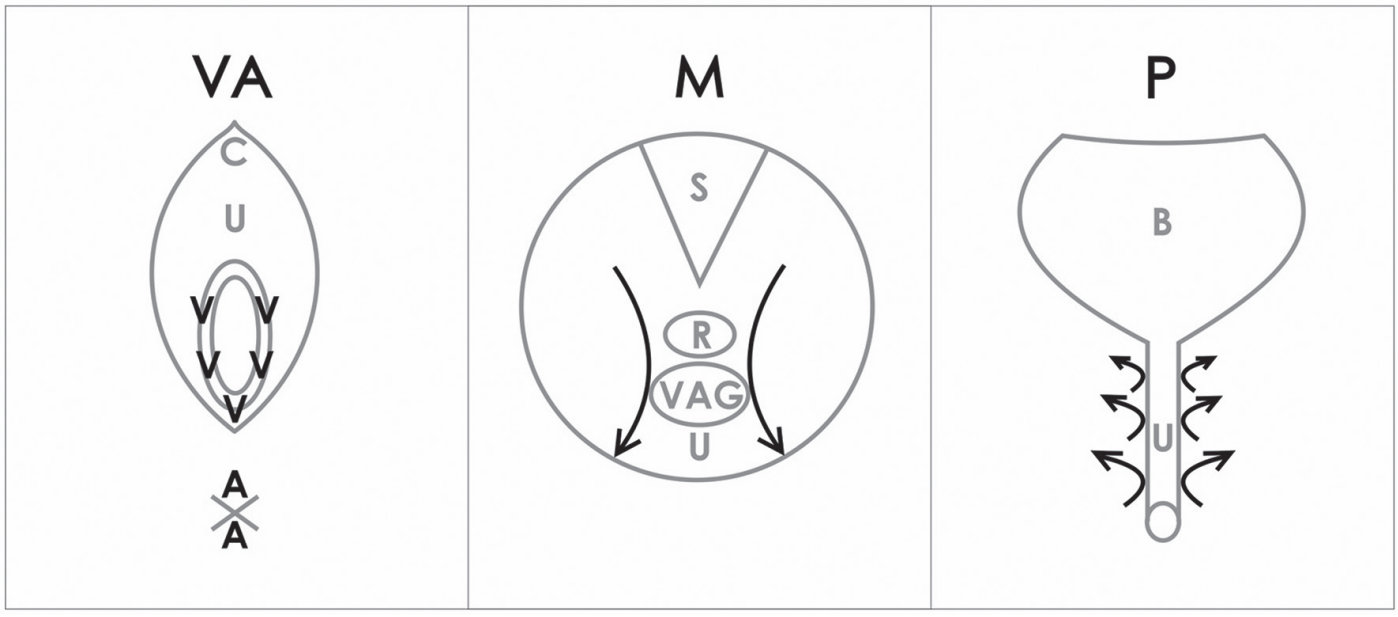


**Figure 1.** VAMP examination diagram (reproduced from 22) permission of the Polish Society of Gynecologists and Obstetricians (arrows shows the direction of the internal digital examination)

V: vulva 5 points cotton swab pressure; A: anus 2 points cotton swab pressure; C: clitoris; U: urethra; S: sacrum; R: rectum; VAG: vagina; B: bladder; VAMP: Vulva, anus, pelvic muscles and paraurethra

VAMP protocol can be applied during gynecological examination or used separately by healthcare providers as part of the diagnosis of persistent vulvar pain or dyspareunia in patients.

## Examination schedule in Vulvodynia

In the diagnosis of persistent vulvar pain in patients, the first step is a detailed history, with particular questions directed to identifying comorbidities.[1,7,13] The second step is gynecological exam to find the cause of pain as mucosa and skin diseases, vaginal infections, or others if visible. On the basis of exclusion other sources of vulvar pain of at least 3 months duration, diagnosis of vulvodynia (in 4 categories i.e., pain location, provocation, onset, and temporal pattern) is undertaken.[1] The third step is focused on PFM status, as the potential source of chronic or recurrent anourogenital pain what is specifically required for PV diagnosis. [7,8,12,13] In vulvodynia patient, when PFM overactive state is not confirmed, other potential associated factors should be taken under consideration.[1]

There are ten important points that need to feature in an examination schedule:

An explanation must be given to the patient that the gynecological examination will focus on pain. Verbal consent needs to be obtained. The patient is forewarned in relation to each step to minimize their fear.

Ask a patient to position themselves in a gynecological chair or couch in a dorsal lithotomy position in preparation for the examination.

Visually examine the vulvar, perineal and perianal area to exclude any pathology as a cause of vulvar pain, itch or discomfort.

Explain the Numeric Rating Scale (NRS) before the examination, and ask the patient for a pain rating of each examined point.

Using a dry cotton swab, gently press the vulva, at the base of hymenal remnant in five different points (in a random or consecutive sequence), avoiding the urethral external meatus area (12 o'clock). Note the maximum NRS rating as a score for V (Vulva) as per Figure 1.

Cotton swab pressure is then applied to the anus at two different points, in the same manner as with the vestibulum area. The maximum NRS score is noted as a score for A (anus), as in Figure 1.

Next a speculum examination is conducted, if it is possible and/or acceptable. Pathological vaginal discharge should be excluded, any other pathology noted.

Any discharge (taken from lateral vaginal wall) should be obtained and assessed for pH, amine odor on application of (5%-10%) KOH (whiff test), microscopic examination for Candida presence is advocated in the office or culture swab may be taken (not obligatory).[22]

A lubricated, gloved index finger is inserted for bimanual transvaginal or rectal examination, for purposes of excluding pelvic inflammatory disease or pelvic mass. Rectal route is indicated if hymen does not permit access, or if the vestibule is too painful or there is significant catastrophizing and vaginal

approach is not possible. Single digital gynecological examination (instead of two fingers insertion) is preferable in every patient and strictly advised in patient with vulvar pain.

The index finger then examines the PFMs (vaginally or rectally). Laterally, progressing from the posterior section, on each side of the rectum (from as far back as possible), along the muscle belly of the iliococcygeus muscle to the anterior portion of the puborectalis muscle, but avoiding the rectum. This is repeated bilaterally with marked tension applied to muscles, but within the acceptable pain threshold of individual patients. This allows for assessment and differentiation of pain severity in superficial PFMs (bulbospongiosus, ischiocavernosus, painful on pressure the most externally) and deep PFMs (levator ani). These muscles are examined in same manner, although precision as to which muscle is painful is not relevant. Maximum NRS rating is noted as a score for M (Muscles) in the medical records (as shown in Figure 1).

The index finger then examines the paraurethral area examination, lateral to the urethra, compressing against the pubic bone. Examination of the urethra is from the distal to the proximal area (from outside to inside) on both the right and left sides. Pressure is applied cautiously with particular attention to patient's level of pain tolerance. Maximum NRS rating is noted as a score for P (paraurethral area) (as on Figure 1).

In the patient's medical history, the pelvic physical exam result is recorded under the VAMP acronym (for example VAMP 3048, although A point is generally not painful, "0" may be skipped). These scores reflect the maximum NRS pain ratings for the four areas: vulva, anus, muscles and paraurethra. At times the examiner may form an impression that the pain rating is overestimated or underestimated, but because it is always a subjective score, it is noted as the patient rates it. Pelvic physical examination using the VAMP protocol is not time consuming for a physician and for a patient when it is carried out as part of the gynecological examination.

## Pelvic physical exam requirements

According to Meister et al.[14], based on a systematic review of literature (55 studies since 1946), the following eight recommendations are made in relation to myofascial pain examinations in women;

Document counseling and consent: verbal consent needs to be based on thorough explanation. Vulvar and pelvic examination becomes part of a regular gynecological exam that is performed in patients with pain symptoms. In 45.5% of studies, palpation of the pelvic floor was included in the bimanual physical exam.

Position: a dorsal lithotomy position was chosen in 78.9% of publications.

Numbers of digits inserted: single digit palpation was used in 61,8 % of articles, using gloves and lubrication. A vaginal approach was preferred in 85% of papers, over a rectal approach.

Utilize clock-face orientation (with the 12 o'clock for - symphysis pubis and 6 for PFM).

Preferred order of the examination was mentioned in 30.9% of studies: with 35% beginning with the superficial muscles and then proceeding to deep muscles.

Identifying muscles location: the superficial muscles (2 and 10 o'clock), ischiocavernosus (1 and 11 o'clock), transverse perineal muscles (3 and 9 o'clock), deep layer: pubococcygeus (left: 7 and 11 o'clock, right: 1 and 5 o'clock), iliococcygeus (4 and 8 o'clock) and coccygeus (5 and 7 o'clock, and requires deeper digital insertion).

Examination technique: single sites mid-belly muscle technique is preferable, with a bilateral examination of the levator ani muscle, and obturator internus (reported in only 50% of studies). In some studies, the muscles examined were not specified, but in the greater majority (89.1%) muscles were identified. One third of studies recommend examining levator ani muscle 69.1% of isolated location, 41% in general, 52,7% specified which muscle component should be identified and palpated. Piriformis muscles may not be possible to reach by internal palpation. Lack of description of examination of PFM techniques was identified in 47.3% of articles, with no standard given for the amount of pressure being applied to the PFM in 87.3% of articles (no defined pain/pressure threshold).

Quantifying self-reported pain upon local pressure: the NRS was used in 68% of studies.

According to the VAMP protocol authors, identification of specific pain location during internal pelvic exam is not necessary to draw the conclusion of PFM overactive state.

Only 41.8% of studies incorporate other areas (anus, abdomen, urethra) in pelvic exam. The IMAP research authors[8,18] emphasized the paraurethral area for examination and did not focus on the paraurethral fascia as a possible source of pain. The literature indicated that the anal region was an irrelevant area for assessing PFM pain in conjunction with hypertonic condition. Some suggested that palpation of this area might help identify patients who overestimated the level of pain as may be the case in catastrophic patients. For healthcare practitioner this may be an opportunity to assess the anal area, to exclude comorbid anal pathology (anal fissure, lichens or hemorrhoidal disease) and to use as a means of assessing the validity of the pain scores given by

individuals.To differentiate woman with pelvic pain arising from overactive PFM dysfunction remains a challenge for researchers and practitioners. The most important issue is to distinguish a woman with vulvodynia and other chronic pain patients who may benefit from pelvic myofascial based therapies.[8,14,15,23,24] Once an evidence based, standardized examination is established, the effort can then turn to promoting physician education.[14]

### Limitations

The usefulness of VAMP protocol requires reliability, validity of the outcome measures, what is already scheduled in randomized clinical trial by the study authors. The reliability of the participant's pain score can be a source of bias, as perceived pain is always a subjective experience. Furthermore, the examination was performed unblinded, and was based on digital and cotton swab pressure application, without use of calibrated instruments, for purpose of simplifying the diagnostic protocol and ease of clinical practice.

## CONCLUSION

The VAMP protocol is proposed as a simple tool for physical examination. A total of four anatomical areas should be examined by the gynecologist, for the sake of a more reliable assessment than the widely used cotton swab test used in the assessment of vulvodynia women. For the patient and healthcare provider the VAMP protocol is not time consuming along with a gynecological examination to obtain information about potential PFM pain arising from overactive muscle dysfunction, as a contributor to vulvodynia. Three of the regions (VMP) are known to be painful on application of pressure in vulvodynia women.[15] Based on these findings a physical examination schedule is proposed for women presenting with vulvodynia. Confirmation of PFMs pain and dysfunction are essential in order to recommend conservative management involving pelvic floor physical therapy, general myofascial therapy and biofeedback. The findings give significant credence to peripheral mechanisms of pain, in which pain of soft tissue origin is examined and potentially responsive to myofascial therapies.[8,23,24]

### Acknowledgements

The authors thank Marek Jantos for his manuscript comments.

### Ethics

**Peer-review:** Internally peer-reviewed.

## DISCLOSURES

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

## REFERENCES

1. Bornstein J, Goldstein AT, Stockdale CK, et al. Consensus vulvar pain terminology committee of the International Society for the Study of Vulvovaginal Disease (ISSVD), the International Society for the Study of Women's Sexual Health (ISSWSH), and the International Pelvic Pain Society (IPPS). 2015 ISSVD, ISSWSH, and IPPS Consensus Terminology and Classification of Persistent Vulvar Pain and Vulvodynia. J Low Genit Tract Dis 2016; 20: 126-30.
2. Reed BD, Harlow SD, Sen A, et al. Prevalence and demographic characteristics of vulvodynia in a population-based sample. Am J Obstet Gynecol 2012; 206: 170.e1-9.
3. Harlow BL, Stewart EG. A population-based assessment of chronic unexplained vulvar pain: have we underestimated the prevalence of vulvodynia? J Am Med Womens Assoc 2003; 58: 82-8.
4. Reissing ED, Brown C, Lord MJ, Binik YM, Khalife S. Pelvic floor muscle functioning in women with vulvar vestibulitis syndrome. J Psychosom Obstet Gynaecol 2005; 26: 107-13.
5. Messelink B, Benson T, Berghmans B, et al. Standardization of Terminology of Pelvic Floor Muscle Function and Dysfunction: Report from the Pelvic Floor Clinical Assessment Group of the International Continence Society. Neurourol Urodyn 2005; 24: 374-80.
6. Nunns D, Mandal D, Byrne M, et al. Guidelines for the management of vulvodynia. Br J Dermatol 2010; 162: 1180-5.
7. Goldstein AT, Pukall CF, Brown C, Bergeron S, Stein A, Kellogg-Spadt S. Vulvodynia: Assessment and Treatment. J Sex Med 2016; 13: 572-90.
8. Jantos M. A Myofascial Perspective on Chronic Urogenital Pain in Women. In: Santoro GA, Wieczorek AP, Sultan AH. Springer 2nd ed Springer Nature Switzerland AG 2021
9. Pastore EA, Katzman WB. Recognizing Myofascial Pelvic Pain in the Female Patient with Chronic Pelvic Pain. J Obstet Gynecol Neonatal Nurs 2012; 41: 680-91.
10. Butrick CW. Pelvic Floor Hypertonic Disorders: Identification and Management. Obstet Gynecol Clin North Am 2009; 36: 707-22.
11. Haylen BT, de Ridder D, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J 2009; 21: 5–26.
12. Zolnoun D, Bair E, Essicks G, Gracely R, Vinita G, Maixner W. Reliability and Reproducibility of Novel Methodology for Assessment of Pressure Pain Sensitivity in Pelvis. J Pain 2012; 13: 910-20.
13. Grimes W. Pelvic floor dysfunction. Updated 6/28/2020; https://www.statpearls.com/articlelibrary/viewarticle/40639/#ref_31804265

14. Meister MR, Shivakumar N, Sutcliffe S, Spitznagle T, Lowder JL. Physical examination techniques for the assessment of pelvic floor myofascial pain: a systematic review. Am J Obst Gynecol 2018; 219: 497.e1-13.

15. Baszak-Radomanska E, Wanczyk-Baszak J, Paszkowski T. Pilot study of testing a clinical tool for pelvic physical examination in patients with vulvodynia. Ginekol Pol 2021; 92: 1-7.

16. Sarton J. Assessment of the Pelvic Floor Muscles in Women with Sexual Pain. J Sex Med 2010; 7: 3526-9.

17. Jantos M, Johns S, Torres A, Baszak-Radomanska E. Mapping chronic urogenital pain in women: rationale for a muscle assessment protocol - the IMAP, Part 1. Pelviperineology 2015; 34: 21-7.

18. Jantos M. Pain mapping: A mechanisms-oriented protocol for the assessment of chronic pelvic pain and urogenital pain syndromes. Pelviperineology 2020; 39: 3-12.

19. dos Santos Calderon P, Peixoto RF, Gomes VM, et al. Concordance among different pain scales in patients with dental pain. J Orofac Pain 2012; 26: 126-31.

20. Jantos M, Johns S, Torres A, Baszak-Radomanska E. Mapping chronic urogenital pain in women: insights into mechanisms and management of pain based on the IMAP, Part 2. Pelviperineology 2015; 34: 28-36.

21. Friedrich EG Jr. Vulvar vestibulitis syndrome. J Reprod Med 1987; 32: 110-4.

22. Reed BD, Plegue MA, Harlow SD, Haefner HK, Sen A. Does degree of vulvar sensitivity predict vulvodynia characteristics and prognosis? J Pain 2017; 18: 113-23.

23. Aguilar VC, White AB, Rogers RG. Updates on the diagnostic tools for evaluation of pelvic floor disorders. Curr Opin Obstet Gynecol 2017; 29: 458-64.

24. Wallace SL, Miller LD, Mishra K. Pelvic floor physical therapy in the treatment of pelvic floor dysfunction in women. Curr Opin Obstet Gynecol 2019; 31:485-93.