The Canadian Le Journal Journal of Canadien des Neurological Sciences Sciences Neurologiques



SPECIAL FEATURES	
Myoglobinuria 1984 Lewis P. Rowland	
Anatomy of the Opioid-Systems	
of the Brain	14
A Research Strategy André Barbeau	2
Hypothesis: Phylogenetic Diseases of the	
Nervous System Harvey B. Sarnat and Martin G. Netsky	2
ORIGINAL ARTICLES	
Spinal Injuries Due to Hockey	
Chris E.U. Ekong, David W. Rowed, Michael L.	
Schwartz, Virginia E. Edmonds and Perry W. Cooper	3
Reversal of Acute Experimental Cerebral Vasospasm by Calcium	
Antagonism with Verapamil Richard Leblanc, William Feindel,	
Lucas Yamamoto, John G. Milton and Mony M. Frojmovic	4
An Atypical Case of Progressive Supranuclear	
Palsy Andrew J. Gomori and Anders A.F. Sima	4
Serial Pattern Shift Visual Evoked Potentials in	
Multiple Sclerosis Werner J. Becker and Irene M. Richards	5
Electrophysiological Studies in Five Cases of Abetalipoproteinemia	
	6
Rupture of an Experimentally Induced Aneurysm in a Primate	
F. Espinosa, B. Weir and T. Noseworthy	•
Hydrocephalus and Headaches in Paget's Disease of the Skull:	
Complete Relief by Ventriculo-Atrial Shunt Chantal Hausser,	
Georges Elie Ouaknine and Jacques Sylvestre	•
Friedreich's Ataxia with Dysautonomia and Labile Hypertension	_
D. Margalith, H.G. Dunn, J.E. Carter and J.M. Wright	7
Fulminating Haemophilus Influenzae b Meningitis	
	_
P. Humphreys, A.L. Jefferies and L.P. Ivan	7
RESEARCH NEWS	
Current MRC Funding and Neuroscience Research Training	
in Canada Pierre Bois	8
BOOK REVIEWS	1
NOTEC AND ANNOUNCEMENTS	

XIX Canadian Congress of Neurological Sciences Edmonton, Alberta

June 26 - 30, 1984

The Official Journal of

The Canadian Neurological Society

The Canadian Neurosurgical Society

The Canadian Society of Clinical Neurophysiologists

The Canadian Association for Child Neurology





Treating spasticity right at the start gives him a better start on the tough road back.

Early intervention with Lioresal can significantly enhance successful rehabilitation, especially before major disabilities become permanent!

- Lioresal helps relieve spasticity resulting from spinal cord injury, multiple sclerosis or other spinal cord disorders.
- Lioresal acts primarily at the spinal level eliminating the problem of troublesome over sedation?
- Lioresal improves overall outlook for long term management.¹

sooner... means a fuller life later.

For brief-prescribing information see page x





THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES LE JOURNAL CANADIEN DES SCIENCES NEUROLOGIQUES

Editor

Robert G. Lee Calgary

Editorial Board

Albert J. Aguayo Montreal

Henry J.M. Barnett

London

Paul Bédard Quebec

Henry B. Dinsdale

Kingston

Guy Geoffroy Montreal

Alan Hudson Toronto

Yves Lamarre Montreal

Associate Editor

André Barbeau Montreal

Bernard Lemieux Sherbrooke

William J. Logan Toronto

Morton Low Vancouver

Thomas P. Morley

Toronto

Thomas J. Murray

Halifax

Donald Paty Vancouver

Sidney J. Peerless

London

Founding Editor

Robert T. Ross Winnipeg

Terry Picton Ottawa

Jean Reiher Sherbrooke

Leo P. Renaud Montreal

Barry Rewcastle Calgary

Matthew W. Spence Halifax

William G. Tatton

Bryce Weir Edmonton

Toronto

Editorial Assistant

Sally Gregg Calgary

Book Review Editor

T. Peter Seland Calgary

THE EDITORIAL BOARD wishes to publish original work in the basic and clinical neurosciences on the understanding that it has not been and will not be published elsewhere. Review articles on timely subjects will be accepted. Manuscripts must be in triplicate including illustrations. One of the copies must be the original, ribbon copy. Manuscripts should be typed double spaced, on white paper.

Papers will be accepted in French or English. All papers should be accompanied by a short résumé in both languages. The résumé translation will be done by the editorial board if requested.

Papers should be identified only by the full name of the author, or authors, and the name of the place in which the work was done.

ILLUSTRATIONS: Photographs should be unmounted on glossy paper and show magnification scale. They should be marked on the back with figure number, title of paper and name of author.

Diagrams should be in India ink and large enough to be informative after reduction.

All illustrations should be referred to as figures, numbered consecutively, not included in the body of the text and all captions

should be typed on a separate piece of paper.

Colored illustrations cannot usually be accepted unless the author is prepared to assist with the cost of reproduction.

REFERENCES to authors outside the context of the sentence should read (Name, Year). i.e. "However, a recent study (Bird and Iverson, 1975) showed a decreased, etc." Authors mentioned within the context of the sentence should read Name (Year), "i.e. . . . twenty years since Ecker and Reimenshender (1951) demonstrated, etc." References should be typed in alphabetical order on a separate sheet and include author's name, initials, year, title, publication, volume first and last page, i.e. Isacson, P. (1967). Myx-oviruses and autoimmunity. Progress in Allergy, 10, 256-292. Abbreviations should be the same as those used in Cumulated Index Medicus.

Textbook references should include name of text, author's name, page number, publisher and city.

REPRINTS: Fifty reprints will be supplied free if ordered when the galley proofs are returned. More may be ordered at a nominal charge. Corrections and changes in the galley proofs, apart from printer's errors may be charged to the author.

This journal is indexed by Index Medicus, Excerpta Medica and Current Contents — Clinical Practice and Life Science.

SUBSCRIPTIONS: This journal is issued four times a year. The annual rate is \$40.00 for Canada and the U.S.A. \$44.00 elsewhere. Internes, Residents, Pre- and Post-Doctoral Students, \$20.00 per annum. Single copies \$12.00 each.

ADVERTISING: Enquiries regarding advertising space and rates should be directed to LEX LTD. VANCO PUBLICATIONS, 431 Alden Road, Markham, Ontario L3R 3L4. Telephone — (416) 477-2030.

All communications, manuscripts, subscriptions, etc., should be sent to the Editor, Canadian Journal of Neurological Sciences, Faculty of Medicine, 2500 University Drive, Calgary, Alberta, Canada T2N 1N4.

COPYRIGHT ® 1983 by THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. No part of this journal may be reproduced in any form without the prior permission of The Canadian Journal of Neurological Sciences. ISSN 0317-1671.

Published in conjunction with the University of Calgary Press.

Printed by McAra Printing Limited, 105, 2507 - 12th Street N.E., Calgary, Alberta T2E 7L5 Mailed under second class registration number 3307. Postage paid at Calgary, Alberta.

PUBLICATIONS COMMITTEE

Donald Baxter Montreal Andrew Eisen Vancouver

Terry Myles Calgary

Council:

CANADIAN NEUROLOGICAL SOCIETY

President Past-President Vice-President Secretary-Treasurer Thomas J. Murray Henry B. Dinsdale Robert F. Nelson Garth M. Bray 1650 Cedar Avenue

Jean Pierre Bouchard William McCormick Donald Calne Ali Rajput Peter Seland

Monique Lefebvre-d'Amour

1650 Cedar Ave Montreal, P.Q. H3G 1A4

CANADIAN NEUROSURGICAL SOCIETY

President
Past-President
President-Elect
Secretary-Treasurer

Leslie Ivan
Stuart Huestis
Stanley Schatz
Gary Ferguson
University Hospital
London, Ontario

Council:
Jacques Boucher
Derek Fewer
Mohamed Khan
Hart Schutz
Andre Olivier
Barry Purves

CANADIAN SOCIETY OF CLINICAL NEUROPHYSIOLOGISTS

President
Past-President
Secretary-Treasurer

Warren Blume Andrew Eisen Terry Picton

N6A 5A5

Terry Picton
Ottawa General Hospital
501 Chemin Smythe Road
Ottawa K1H 8L6

Council:
Peter Ashby
Gordon Blair
Monique D'Amour
Michael Jones
Sherrill Purves

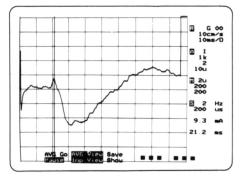
CANADIAN ASSOCIATION FOR CHILD NEUROLOGY

President
Past-President
Vice-President
Secretary-Treasurer

Frederick Andermann Rosalind Curtis R. Haslam Daune L. McGregor Hospital for Sick Children 555 University Ave. Toronto M5G 1X8 Council: Peter Humphreys J.U. Crichton A. Larbrisseau



2-Channel Neuro-Myograph for Clinical EMG and Evoked Response

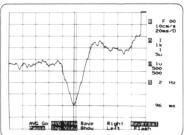


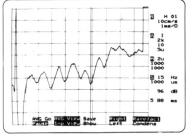
DISA - world leaders in electromyographical equipments - has created the highly advanced Neuromatic® 2000 for handling all electromyography measurements occurring in practice, together with evoked response examinations.

- ★ Microprocessor control of all parameters and functions
- ★ 10 investigation programs with preselectable settings
- * Patient isolated preamplifiers with high sensitivity
- ★ Impedance test of electrodes
- ★ 2-channel normalized averager
- * Alpha-numeric display of settings, measuring values and calculations on built-in video monitor or slave monitor
- * Markers for measurement of amplitude, latency and duration
- ★ Incorporates stimulators for evoked response - visual, auditory and somatosensory













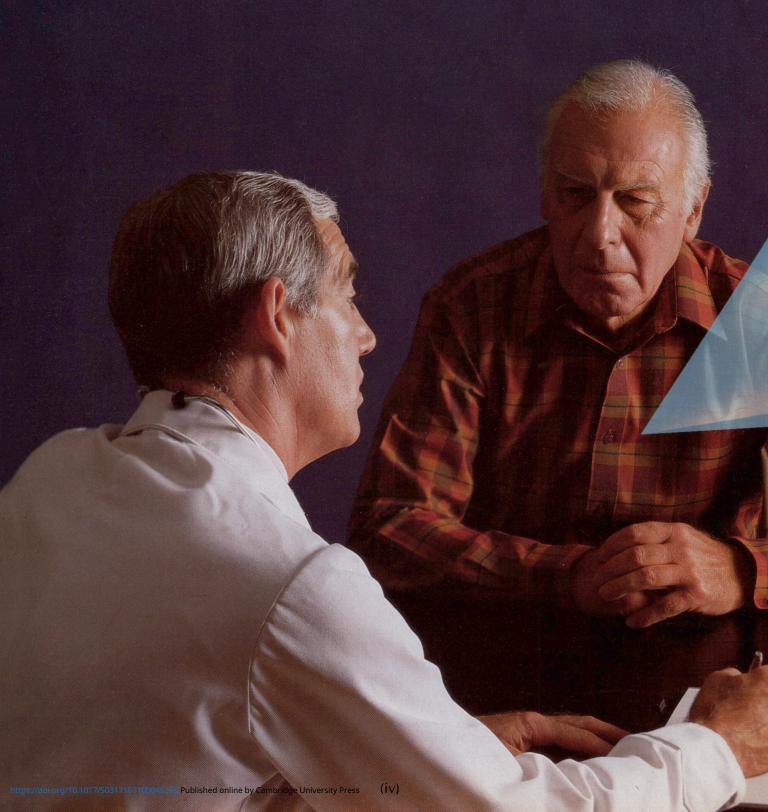
DISA ELECTRONICS LTD.

140 Shorting Road, Scarborough, Ontario, M1S 3S6, Canada

Phone: (416) 298-2091 - Telex: 065-25137

Combat the Threat of Thrombosis...

Choose Asasantine® for Your Patients with Coronary Artery Disease



"Increased platelet activity may have an important role in inducing intimal damage and vasospasm"

"Whatever the precise sequence of events, formation of platelet aggregates in the coronary vessels could limit blood flow and either cause the ischemic event or result in deterioration of already compromised blood flow to the myocardium."

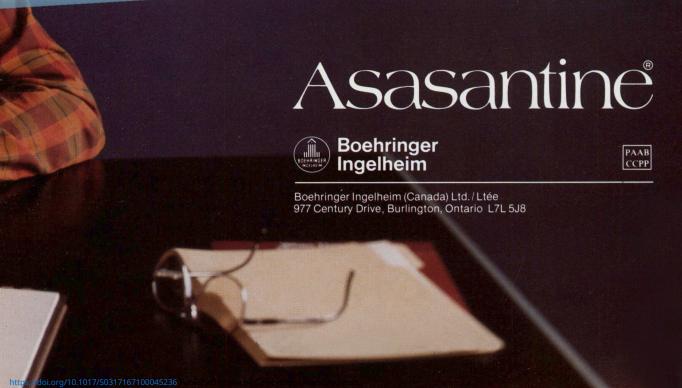
Asasantine® Normalizes Platelet Reactivity

Asasantine[®] capsules contain 75 mg Persantine[®] (dipyridamole) plus 330 mg ASA. Clinical trials demonstrate the effectiveness of this combination in reducing platelet adhesion and aggregation, and subsequent thrombus formation. Consequently, Asasantine[®], is an important choice of therapy in preventing recurrent myocardial infarction.

Asasantine® Reduces Coronary Incidence

• 1 capsule T.I.D. • Minimal side effects • No cardiovascular-related contraindications





Asasantine

BRIEF PRESCRIBING INFORMATION

THERAPEUTIC OR PHARMACOLOGICAL CLASSIFICATION

Inhibitor of platelet adhesion and aggregation

INDICATIONS AND CLINICAL USE

Combined therapy with dipyridamole and ASA (Asasantine) is indicated in patients who are recovering from a myocardial infarction. The rate of re-infarction is significantly reduced by such therapy.

CONTRAINDICATIONS

Salicylate sensitivity, active peptic ulcer.

WARNING

Patients should be cautioned about the possibility of additional toxic effects of ASA if they are taking "over-the-counter" ASA containing remedies, including cough and cold medications.

PRECAUTIONS

Since excessive doses of dipyridamole can produce peripheral vasodilation, it should be used with caution in atients with hypotension.

ASA should be administered cautiously to patients with asthma and other allergic conditions, a history of gastrointestinal ulcerations, bleeding tendencies, significant anemia or hypo-prothrombinemia.
Patients taking 2 to 3 g of ASA daily are at an increased risk

of developing severe gastrointestinal bleeding following the ingestion of alcohol.

Since salicylates interfere with maternal and infant blood clotting and lengthen the duration of pregnancy and parturition time, they should not be administered during the last trimester of pregnancy unless the need outweighs the potential risks.

Caution is necessary when salicylates and anticoagulants are prescribed concurrently, as salicylates can depress the concentration of prothrombin in the plasma.

Patients receiving concurrent salicylates and hypoglycemic

therapy should be monitored closely, since reduction of the

hypoglycemic drug dosage may be necessary. Although salicylates in large doses are uricosuric agents, smaller amounts may depress uric acid clearance and thus decrease the uricosuric effects of probenecid, sulfinpyrazone, oxyphenbutazone and phenylbutazone. Caution should be exercised when corticosteroids and salicylates are used concurrently.

Acute hepatitis has been reported rarely in patients with systemic lupus erythematosus and juvenile rheumatoid arthritis with plasma salicylate concentrations above 25 mg/100 mL. Patients have recovered upon cessation

Salicylate ingestion should be restricted in patients receiving indomethacin (and perhaps other non-narcotic analgesics) for conditions such as rheumatoid arthritis. Salicylates can produce changes in thyroid function tests.

Sodium excretion produced by spironolactone may be

decreased by salicylate administration.

Concomitant ingestion of salicylates and aminosalicylic acid (PAS) or aminobenzoic acid (PABA) in normal doses may

lead to increased toxicity and salicylism.
Salicylates reportedly displace sulfonylureas, penicillins and methotrexate from their binding sites on plasma proteins. Salicylates also retard the renal elimination of methotrexate.

ADVERSE REACTIONS

In a trial of 2026 patients in recurrent myocardial infarction, the most common patient complaints, except for headaches, were those associated with ASA administration. In order of frequency of occurrence, these were stomach pain, headaches, heartburn, dizziness, constipation, hematemesis, bloody stools and/or black, tarry stools nausea and vomiting. An increased frequency of elevations of serum urea nitrogen, uric acid and creatinine were noted in the active treatment groups but increases for individual patients were small and not associated with clinical problems. There was also a slightly greater frequency of elevated systolic blood pressure readings in the active

treatment groups.

When dipyridamole has been used alone, headache, dizziness, nausea, flushing, syncope or weakness and skin rash have occurred during initiation of therapy. In most cases, these tend to be minimal and transient. Gastric irritation, emesis and abdominal cramping may occur at high dosage levels. Rare cases of what appears to be an aggravation of angina pectoris have been reported, usually at the initiation of therapy. On those uncommon occasions when adverse reactions have been persistent or intolerable to the patient, withdrawal of medication has been followed promptly by cessation of the undesirable symptoms. For ASA alone the following side effects have been reported: gastrointestinal — nausea, vomiting, diarrhea, gastrointestinal bleeding and/or ulceration; ear — tinnitus, vertigo, hearing loss; hematologic — leukopenia, thrombocytopenia, purpura; dermatologic and hypersensitivity — urticaria, angioedema, pruritis, skin eruptions, asthma, anaphylaxis; miscellaneous — acute, reversible hepatotoxicity, mental confusion, drowsiness, sweating, thirst.

SYMPTOMS AND TREATMENT OF OVERDOSAGE

Hypotension, as a result of high serum levels of dipyridamole, is likely to be of short duration if it occurs but vasopressor substances may be used if necessary. Salicylate overdosage SYMPTOMS may include rapid and deep breathing, nausea, vomiting, vertigo, tinnitus, flushing, sweating, thirst and tachycardia. In more severe cases, acidbase disturbances including respiratory alkalosis and metabolic acidosis can occur. Severe cases may show fever, hemorrhage, excitement, confusion, convulsions or coma

and respiratory failure.
TREATMENT of salicylate overdosage consists of prevention and management of acid-base and fluid and electrolyte disturbances. Renal clearance is increased by increasing urine flow and by alkaline diuresis but care must be taken in this approach to not further aggravate metabolic acidosis and hypokalemia. Acidemia should be prevented by administration of adequate sodium containing fluids and sodium bicarbonate.

Hypoglycemia is an occasional accompaniment of salicylate overdosage and can be managed by glucose solutions. If a hemorrhagic diathesis is evident, give Vitamin K. Hemodialysis may be useful in complex acid-base disturbances particularly in the presence of abnormal renal

DOSAGE AND ADMINISTRATION

The recommended oral dose is 1 capsule of Asasantine, 3 times a day, in patients who have suffered a previous myocardial infarction.

AVAILABILITY

Asasantine is available as an opaque orange and yellow hard gelatin capsule. Each capsule contains 75 mg Persantine and 330 mg ASA.

Supplied in packages of 100 capsules.

Product Monograph available on request.

REFERENCES:

Myocardial ischemia in man: abnormal platelet aggregation and prostaglandin generation. Mehta, J. and Mehta, P. In: Platelets and Prostaglandins in Cardiovascular Disease. Editors: Mehta, J. and Mehta, P. Futura Publishing Co., New York, 345–358, 1981.

² Mehta, J. Platelets and Prostaglandins in Coronary Artery Disease-Rationale for use of platelet suppressive drugs Jama 1983; 249: 2818-2823.

занна 1909, счэт. 2018–2823.

3 Pumphrey, C. W., Chesebro, J. H. et al. In Vivo Quantitation of Platelet Deposition on Human Peripheral Arterial Bypass Grafts Using Indium — 111-labelled Platelets — Effect of Dipyridamole and Aspirin. The American Journal of Cardiology, 1983; 51: 796-801.



Boehringer Ingelheim

Boehringer Ingelheim (Canada) Ltd./Ltée 977 Century Drive, Burlington, Ontario L7L 5J8

fiorina

2 Fiorinal stat stops headaches fast

Analgesic/Sedative Prescribing information

Indications - Fiorinal® (Regular): In all conditions where simultaneous sedative and analgesic action is required, such as muscle contraction (tension) headache and mixed migraine headaches, menstrual and postpartum tension and pain. May be given in combination with Cafergot and Cafergot-PB when there is a tension headache in association with or following a vascular headache.

*Fiorinal®-C: In all types of pain situations including: non-vascular headaches, postoperative pain, postpartum pain, pain following trauma, arthralgia, bursitis, dysmenorrhea, pain associated with neoplasia, strains, sprains, dislocations and fractures, sinusitis, influenza, low back pain, pain associated with dental procedures.

Contraindications: Porphyria, hypersensitivity to any of the components. (Fiorinal*-C only – gastrointestinal ulceration). Overdose of, or intoxication due to, alcohol, hypnotics, analgesics and psychotropic drugs.

Precautions: Due to the presence of butalbital in Fiorinal® and butalbital and codeine in Fiorinal®-C, these drugs may be habit forming. Excessive or prolonged use should be avoided. As with most drugs, activities necessitating mental alertness such as operating hazardous equipment or driving a vehicle, should not be undertaken until the patient's response and sensitivity to the medication are established. sensitivity to the medication are established.
Fiorinal® (Regular) should be used with caution in the presence of peptic ulcer. During pregnancy and lactation Fiorinal® and Fiorinal®. C should be taken only upon medical advice. Keep out of the reach of children.

Adverse Reactions: In rare instances drowsiness, dizziness, nausea, vomiting, constipation, skin rash and miosis are possible adverse effects.

Composition: Fiorinal® (Regular) – Sandoptal® (butalbital) 50 mg, Caffeine U.S.P. 40 mg, Acetylsalicylic Acid U.S.P. 330 mg.
Fiorinal®-C¼ – Sandoptal® (butalbital) 50 mg, Acetylsalicylic Acid U.S.P. 330 mg, Caffeine U.S.P. 40 mg, Codeine Phosphate U.S.P. 15 mg.
Fiorinal®-C½ – Sandoptal®(butalbital) 50 mg, Acetylsalicylic Acid U.S.P 330 mg, Caffeine U.S.P. 40 mg, Codeine Phosphate U.S.P. 30 mg.

V.S.P. 40 mg, Codeine Phosphate U.S.P. 30 mg.

Supply - Fiorinal® (Regular): Available in capsules or tablets for the patient's convenience. Bottles of 100 and 500 capsules and tablets.

Fiorinal®-C: Bottles of 100 and 500 capsules.

Dosage:

Fiorinal® (Regular)

Adults: 2 capsules or tablets at once, followed if necessary by 1 capsule or tablet every 3 to 4 hours; up to a maximum of 6 capsules or tablets daily, or as directed by the physician. Children: One to 3 capsules or tablets a day,

according to age.

Fiorinal®-C 1/4 & C 1/2: Adults: One or 2 capsules at once, followed if necessary by 1 capsule every 3 to 4 hours; up to a maximum of 6 capsules daily, or as directed by the physician.

References: 1. Kibbe MH. Dis Nerv Syst 1955; 16:3.* 2. Weisman SJ. Am Pract Digest Treat 1955; 6(7): 1019-21.* 3. Glassman JM, Soyka JP. Curr Ther Res 1980; 28(6): 904-15. 4. Data on file. Sandoz (Canada) Ltd.

*The composition of Fiorinal used in the reference studies was: Sandoptal (butalbital) 50 mg; caffeine - 40 mg; ASA - 200 mg; and phenacetin - 130 mg.

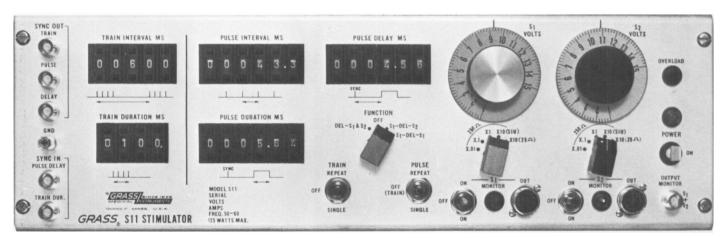
Full prescribing information available to physicians and pharmacists upon request.





DUAL OUTPUT DIGITAL STIMULATOR

with Quartz Timed Programmable Digital Parameters



GRASS MODEL S11 SPECIFICATIONS

TRAIN INTERVAL

- SINGLE
- REPETITIVE: 1 MS to 100 SEC

TRAIN DURATION

1 MS to 10 SEC

PULSE INTERVAL

- SINGLE
- REPETITIVE: 100 µS to 100 SEC

PULSE DURATION (S₁, S₂)

10 μS to 10 SEC

PULSE DELAY

10 μS to 10 SEC

OUTPUTS (Two)

- \bullet + 0.01 to + 150 v
- Independently adjustable
- Biphasic with two Stimulus Isolation Units

FUNCTIONS

- S₁:Off-On
- S2:Off-On
- Delay S₁ & S₂ simultaneously
- S1 Delay S2
- S1 Delay S1

SYNC IN

- To Pulse Delay
- To Train Duration

SYNC OUT

- Train
- Pulse
- Delay

MONITORS

- S₁ and S₂ Lamps
- S₁ + S₂ BNC Out

PHYSICAL SIZE

- 17-1/4"W x 5-1/4"H x 8-1/2"D
- 19" Rackmount brackets supplied
- Weight 19 lbs.

STIMULUS ISOLATION UNITS (Optional)

- SIU5: Radio Frequency Isolation
- PSIU6: Optically isolated with wide current range for research
- SIU7: Optically isolated with limited pulse duration for clinical use
- SIU8T: Transformer Coupled
- CCU1: Converts voltage output to a constant current output

GRASS INSTRUMENT COMPANY Tel.

Tel. 617-773-0002

|GRASS

101 Old Colony Avenue • P.O. Box 516 • Quincy, MA 02169 © 1983 S919883



For the management of Vertigo

Proven efficacy

"(Serc) is now a proven, useful therapeutic agent in the treatment of Ménière's disease, especially in the control of vertigo."

Restores vestibular responses

"In a preliminary trial (Wilmot 1971) using objective testing of both auditory and vestibular function... the results showed statistical significance in favour of Serc."²

Reduced severity of episodic vertigo

"...a significant improvement in favour of the drug (Serc) with regard to vertigo, tinnitus and deafness. Vertigo was the most responsive symptom."

Well tolerated

"No adverse reactions were observed."1

REFERENCES:

1 Frew, I.J.C. et al: Postgrad. Med. J.; 52:501-503, 1976. 2 Wilmot, T.J. et al: J. Laryng. Otol; 9:833-840, 1976.

PRESCRIBING INFORMATION:

INDICATIONS: SERC may be of value in reducing the episodes of vertigo in Meniere's disease. No claim is made for the effectiveness of SERC in the symptomatic treatment of any form of vertigo other than that associated with Meniere's disease.

DOSAGE AND ADMINISTRATION: The usual adult dosage has been one to two tablets (4 mg. each) administered orally three times a day.

Recommended starting dose is two tablets three times daily. Therapy is then adjusted as needed to maintain patient response. The dosage has ranged from two tablets per day to eight tablets per day. No more than eight tablets are recommended to be taken in any one day.

SERC (betahistine hydrochloride) is not recommended for use in children. As with all drugs, SERC should be kept out of reach of children.

CONTRAINDICATIONS: Several patients with a history of peptic ulcer have experienced an exacerbation of symptoms while using SERC. Although no causual relation has been established SERC is contraindicated in the presence of peptic ulcer and in patients with a history of this condition. SERC is also contraindicated in patients with pheochromocytoma.

PRECAUTIONS: Although clinical intolerance to SERC by patients with bronchial asthma has not been demonstrated, caution should be exercised if the drug is used in these patients.

USE IN PREGNANCY: The safety of SERC in pregnancy has not been established. Therefore, its use in pregnancy or lactation, or in women of childbearing age requires that its potential benefits be weighed against the possible risks.

ADVERSE REACTIONS: Occasional patients have experienced gastric upset, nausea and headache.

HOW SUPPLIED: Scored tablets of 4 mg each in bottles of 100 tablets.

Full prescribing information available on request.



Canada Inc.

Dorval, Quebec H9P 2P4



