

The Canadian Journal of Neurological Sciences

Le Journal Canadien des Sciences Neurologiques



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The Official Journal of

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For brief prescribing information see page vi



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Prescribing Information

ACTION AND CLINICAL PHARMACOLOGY

SIBELIUM® (flunarizine hydrochloride) prevents the deleterious effects of cellular calcium overload by reducing excessive transmembrane fluxes of calcium. Flunarizine does not interfere with normal cellular calcium homeostasis. Flunarizine also has antihistaminic properties.

The effects of flunarizine in the prophylaxis of migraine are most pronounced with regards to the reduction of the frequency of attacks. The severity of migraine attacks improves to a lesser extent, while little or no effect is seen on the duration of migraine episodes.

The pharmacokinetic parameters of orally administered flunarizine are summarized in Table 1.

Flunarizine is well absorbed; peak plasma levels are attained 2 to 4 hours after oral administration in healthy volunteers. Plasma concentrations increase gradually during chronic administration of 10 mg daily, reaching a steady state level after 5 to 6 weeks of drug administration. Steady state plasma levels remain constant during prolonged treatment although there is substantial interindividual variation; plasma levels range between 39 and 115 ng/mL.

In 50 elderly patients (mean age 61 years), with intermittent claudication, long term (median 6 months) treatment with flunarizine, 10 mg per day, yielded fairly constant steady state plasma levels albeit with considerable interindividual differences. While plasma flunarizine levels were between 50 ng/mL and 100 ng/mL in 46% of patients, individual values ranged from less than 20 ng/mL to 580 ng/mL. Flunarizine was devoid of cumulative effects as shown by repeated measurements.

As indicated by the large apparent volume of distribution (mean = 43.2 L/kg; range = 26.7 - 79.9 L/kg) seen after the oral administration of 30 mg in healthy volunteers, flunarizine is extensively distributed to tissues. Drug concentrations in tissues, particularly adipose tissue and skeletal muscle, were several times higher than plasma levels. Flunarizine is 99.1% bound; 90% is bound to plasma proteins and 9% distributed to blood cells, leaving less than 1% present as free drug in the plasma water.

Flunarizine is metabolized principally through N-oxidation and aromatic hydroxylation. During a 48 hour period after a single 30 mg dose, minimal urinary (< 0.2%) and fecal (< 6%) excretion of flunarizine and/or its metabolites was found. This indicates that the drug and its metabolites are excreted very slowly over a prolonged period of time.

Flunarizine has a long elimination half-life of about 19 days.

Table 1: Pharmacokinetic parameters of flunarizine in healthy volunteers

No. of Doses	Dose (mg)	C _{max} (ng/mL)	T _{max} (h)	AUC (ng/mL·h)	t _{1/2α} (h)	Cl _p (mL/min)	t _{1/2β} (mean days) [range]
Single Dose Studies	5	30.5	2-4	133 ^a	2.4	443.7	4 [2-8]
	10	81.5		615 ^d	2.8		
	20	117.0	1091 ^d	3.6			
	30	81.6	1169 ^e	5			
Multiple Dose Studies	14	5	2-6	1264 ^d	301.2	4 [4-19]	
	14	10		1678 ^d			19
	14	15	68.4 ^b				
	57	10	114.5				

a Area under curve 0 to 8 hours

c Area under curve 0 to 168 hours

b Plasma concentrations at 2 hours

d Area under curve 0 to 24 hours

INDICATIONS AND CLINICAL USE

SIBELIUM (flunarizine hydrochloride) is indicated in the prophylaxis of classic and common migraine. The safety of flunarizine in long-term use (i.e. for more than 4 months) has not been systematically evaluated in controlled clinical trials. Flunarizine is not indicated in the treatment of acute migraine attacks.

CONTRAINDICATIONS

SIBELIUM (flunarizine hydrochloride) is contraindicated in patients with known hypersensitivity to the drug.

Flunarizine is contraindicated in patients with a history of depression or pre-existing extrapyramidal disorders.

WARNINGS

Clinical studies indicate that flunarizine treatment, even at recommended doses, can produce motor disturbances in subjects who did not show previous neurological deficits. The clinical symptoms resemble Parkinson's disease, however, they do not improve with antiparkinson medication. Experience to date suggests that in most instances the extrapyramidal symptoms tend to be reversible following discontinuation of flunarizine treatment. It is recommended that patients on flunarizine therapy be followed closely and monitored at regular intervals so that extrapyramidal symptoms may be detected early, and if necessary, treatment discontinued.

Clinical studies indicate that flunarizine can, even at recommended doses, precipitate depression, mostly in younger patients.

PRECAUTIONS

Since sedation and/or drowsiness occur in some patients during treatment with SIBELIUM (flunarizine hydrochloride) (see ADVERSE REACTIONS), patients should be cautioned against activities which require alertness or rapid, precise responses (e.g. operating machinery or a motor vehicle) until the response to the drug has been determined.

Use in Pregnancy

To date, there are no data to support the use of flunarizine during pregnancy. It should therefore not be administered to pregnant women unless the anticipated benefits outweigh the potential risks.

Use During Lactation

Studies in lactating dogs have shown that flunarizine is excreted in milk. The concentration of flunarizine in milk is much greater than that in plasma. Breast feeding should therefore be discouraged in women taking flunarizine.

Use in the Elderly

The efficacy of flunarizine in the prophylaxis of migraine has not been established in elderly subjects.

Use in Children

The efficacy of flunarizine in the prophylaxis of migraine has not been established in patients younger than 18 years of age.

Use in Patients with Parkinson's Disease

Flunarizine is contraindicated in patients with pre-existing Parkinson's disease or other extrapyramidal disorders (see CONTRAINDICATIONS). Clinical studies indicate that prolonged flunarizine treatment, even at recommended doses,

can produce motor disturbances in elderly subjects who did not show previous neurological deficits. The clinical symptoms resemble Parkinson's disease however, they do not improve with antiparkinson medication. Experience to date suggests that in most instances the extrapyramidal symptoms tend to be reversible following discontinuation of flunarizine treatment. It is recommended that patients on flunarizine therapy be followed closely so that extrapyramidal symptoms may be detected early and if necessary, treatment discontinued.

Use in Depressive Patients

Clinical studies indicate that flunarizine can, even at recommended doses, precipitate depression mostly in younger patients (see CONTRAINDICATIONS).

Endocrine Effects

Galactorrhea has been reported in a few female patients, some of whom were also on oral contraceptives, within the first two months of flunarizine treatment. Discontinuation of flunarizine therapy resolved the galactorrhea in most cases. Flunarizine therapy caused a mild but significant elevation of serum prolactin levels while GH, LH, FSH and TSH levels did not show significant variation. Two cases of menstrual irregularities have been reported.

Drug Interactions

Evidence from therapeutic trials in epileptic patients indicates that whereas flunarizine does not affect the kinetics of phenytoin, carbamazepine and valproic acid, it does decrease the plasma levels of mephenytoin. Furthermore, steady state levels of flunarizine are reduced by coadministration of two or more anticonvulsants. This is considered to be a result of enhanced first pass metabolism of flunarizine as a consequence of liver enzyme induction by the anticonvulsant medications.

In other studies, flunarizine was shown not to affect the anticoagulant effect of warfarin sodium or the hypoglycemic effect of glibenclamide and insulin.

Use in Patients with Impaired Hepatic Function

Flunarizine is metabolized by the liver, therefore care should be exercised when flunarizine is given to patients with compromised liver function.

ADVERSE REACTIONS

In clinical trials with SIBELIUM (flunarizine hydrochloride) migraine patients, drowsiness (also described as sedation or fatigue) as well as weight gain (and/or increased appetite) occurred fairly frequently, in the order of 20 and 15%, respectively. Of 840 migraine patients, 23 (2.7%) and 9 (1.1%) required withdrawal from flunarizine therapy due to drowsiness and weight gain, respectively.

The most serious side effect encountered in migraineurs during clinical trials was depression. Of 840 migraine patients, 11 (1.3%) were withdrawn due to depression. International post-marketing experience suggests that patients between 20 and 54 years of age with a personal or familial history of depression are particularly at risk (see CONTRAINDICATIONS and PRECAUTIONS).

Clinical experience in other indications and epidemiologic surveys suggest that extrapyramidal symptoms may develop during flunarizine therapy. Elderly patients are particularly at risk (see CONTRAINDICATIONS and PRECAUTIONS).

Other side effects encountered in clinical trials for migraine prophylaxis included the following:

Gastrointestinal:	Heartburn, nausea, emesis, gastralgia;
Central Nervous System:	Insomnia and sleep change, anxiety, dizziness/vertigo;
Miscellaneous:	Dry mouth, asthenia, muscle aches, skin rash

SYMPTOMS AND TREATMENT OF OVERDOSE

There has been no experience to date with overdose of SIBELIUM (flunarizine hydrochloride). Based on the pharmacological properties of the drug, sedation and asthenia may be expected to occur. Treatment should consist of induction of emesis or gastric lavage and supportive measures.

DOSAGE AND ADMINISTRATION

The usual adult dosage of SIBELIUM (flunarizine hydrochloride) 10 mg per day administered in the evening. Patients who experience side effects may be maintained on 5 mg HS.

Duration of Therapy

Clinical experience indicates that the onset of effect of flunarizine is gradual and maximum benefits may not be seen before the patient has completed several weeks of continuous treatment. Therapy therefore should not be discontinued for lack of response before an adequate time period has elapsed, e.g. 6-8 weeks.

DOSAGE FORMS

Composition:	Each red and grey capsule contains 5 mg flunarizine (as hydrochloride).
Availability:	SIBELIUM flunarizine hydrochloride capsules are available in blister packages of 60 capsules.
Storage:	SIBELIUM capsules 5 mg should be stored at or below 25°C, protected from light and moisture.

Product monograph available on request.

REFERENCES

- Sibelium Product Monograph 1990.
- Amery WK et al. Flunarizine, a calcium entry blocker in migraine prophylaxis. *Headache* 1985; 25 (5): 249-54.
- Lucking CH et al. Flunarizine vs. propranolol in the prophylaxis of migraine: two double-blind comparative studies in more than 400 patients. *Cephalalgia* 1988; 8 (suppl 8): 21-6.
- Sorensen PS et al. A placebo-controlled, double-blind, cross-over trial of flunarizine in common migraine. *Cephalalgia* 1986; 6: 7-14.
- Stearo L et al. Prophylaxis of migraine attacks with a calcium-channel blocker: flunarizine vs. methysergide. *J Clin Pharmacol* 1986; 26: 524-8.
- Louis P and Spierings ELH. Comparison of flunarizine (Sibelium) and pizotifen (Sandomigran) in migraine treatment: A double-blind study. *Cephalalgia* 1982; 2: 197-203.
- Rascol A et al. Flunarizine versus pizotifen: a double-blind study in the prophylaxis of migraine. *Headache* 1986; 26: 83-5.
- Greenberg DA. Calcium channel antagonists and the treatment of migraine. *Clin Neuropharmacol* 1986; 9 (4): 311-28.
- Amery WK. Flunarizine, a calcium channel blocker: a new prophylactic drug in migraine. *Headache* 1983; 23: 70-4.
- Amery WK. Onset of action of various migraine prophylactics. *Cephalalgia* 1988; 8 (suppl 8): 11-3.
- Todd PA and Benfield P. Flunarizine: a reappraisal of its pharmacological properties and therapeutic use in neurological disorders. *Drugs* 1989; 38 (4): 481-99.
- Borgers M et al. Selective blockade of cellular Ca²⁺-overload by flunarizine. *Inter Angio* 1984; 3: 25-31.
- Martinez-Lage JM. Flunarizine (Sibelium) in the prophylaxis of migraine. An open, long-term, multicenter trial. *Cephalalgia* 1988; 8 (suppl 8): 15-20.



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Pour les conseils plus détaillés sur le style et la présentation du texte, les auteurs doivent se référer au texte intitulé "Règlements uniformes pour les manuscrits soumis aux journaux biomédicaux". On peut obtenir une copie de ce document en écrivant au bureau du Journal, mais en voici les principaux points: Les articles doivent être présentés selon le plan habituel: "Introduction", "Matériel et méthodes", "Résultats" et "Discussion", mais il est possible d'employer d'autres titres ou sous-titres si nécessaire pour un manuscrit en particulier. Sur une page titre séparée on doit identifier le titre de l'article, les auteurs, les institutions d'où origine le travail, ainsi que l'adresse et le numéro de téléphone de l'auteur à qui devront être adressées les communications. Les remerciements, incluant ceux pour l'appui financier, doivent être dactylographiés sur page séparée à la fin du texte. Les références doivent être numérotées dans l'ordre où elles sont citées dans le texte. Celles qui sont citées seulement dans les tableaux ou légendes d'illustrations sont numérotées selon la séquence établie par la première identification dans le texte de ces tableaux ou illustrations particulières. Les titres des journaux doivent être abrégés selon le style utilisé dans Index Medicus. Les références doivent être complètes, incluant le nom des trois premiers auteurs suivis de "et al", s'il y a plus de trois auteurs, le titre complet, l'année de publication, le numéro du volume et les premières et dernières pages de l'article. Les références aux livres et chapitres de livres doivent aussi inclure le lieu de la publication et le nom de la maison d'édition. Les exemples suivants peuvent être utilisés:

Journaux

Poirier LJ, Filion M, Larochelle L, et al. Physiopathology of experimental parkinsonism in the monkey. *Can J Neurol Sci* 1975; 2: 255-263.

Chapitre de livre

McGeer PL, McGeer EG. Amino acid neurotransmitters. In: Siegel GJ, Albers RW, Agranoff BW, Katzman R, eds. *Basic Neurochemistry*. Boston: Little, Brown & Co, 1981: 233-254.

Les **illustrations** doivent être sur papier brillant de haute qualité et imprimées en blanc et noir, préférablement 127 x 173 mm (5 x 7"). Les illustrations et photographies originales ne doivent pas être soumises. Le coût supplémentaire des illustrations en couleur revient entièrement à l'auteur; les coûts détaillés peuvent être obtenus directement au bureau du Journal. Il faut identifier toutes illustrations en inscrivant au dos le nom de l'auteur et le numéro. Toutes lettres ou flèches appliquées aux illustrations pour identifier un aspect particulier doivent être de qualité professionnelle. Les photomicrographies doivent inclure une barre de calibration dont l'échelle est mentionnée dans la légende. Les légendes des illustrations doivent être dactylographiées sur une page séparée de celles-ci.

Les **tableaux** doivent être sur des pages séparées et être identifiés avec titre. On doit prendre un soin particulier dans la préparation de ces tableaux afin d'assurer que les données soient présentées avec le format le plus clair et le plus précis possible. Chaque colonne doit avoir un court titre. Les explications doivent être placées en dessous du tableau et non en sous-titre. Un tableau ne doit pas être soumis sous forme de photographie.

On doit employer le système international d'unités (SI) pour toutes données de laboratoire, même si celles-ci sont originalement présentées dans un autre système. Les températures doivent être citées en degrés celsius. Les autres données doivent utiliser le système métrique. Les textes en anglais peuvent utiliser l'orthographe anglais ou américain, mais cet usage doit être constant.

Le Journal publie également des **articles de revue** sur des sujets sélectionnés. Ces articles sont généralement sur invitation, mais, à l'occasion, une revue non sollicitée peut être acceptée. Il serait préférable que les auteurs ayant l'intention de soumettre une telle revue contactent d'abord l'Éditeur.

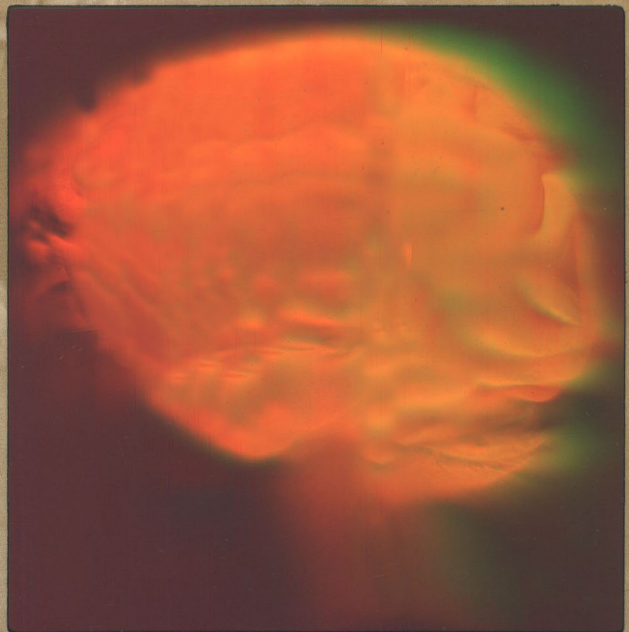
Nous accueillons les **lettres à l'Éditeur**. Celles-ci doivent se limiter à deux pages, double interligne et peuvent contenir une seule illustration et ne doivent citer qu'un maximum de quatre références.

BRINGING BACK CONTROL.



“A controlled-release
formulation of
levodopa/carbidopa

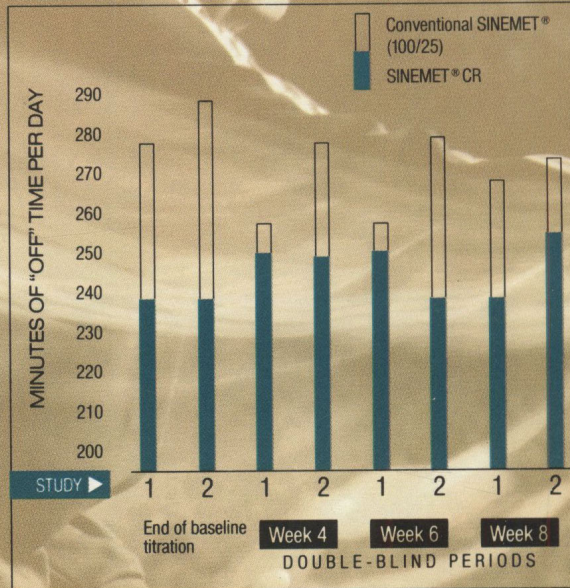
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extended duration of dose-by-dose
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improved control of Parkinsonism
(more “on” time)...”¹



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Sinemet® CR
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Patients can experience greater control with steadier levodopa levels.

New SINEMET® CR reduces "off" time in most patients.



Comparison of "off" times with conventional SINEMET® and SINEMET® CR. Results of 2 multiclinic studies² (adapted).



SINEMET® CR can provide relief of symptoms for all stages of Parkinson's disease.¹

Helps attenuate "on-off" phenomenon.

Improves hours "on" and reduces "off" periods in most patients.¹

Less variation in plasma levodopa levels and the peak plasma level is 60% lower than with conventional SINEMET®.³

Helps prevent motor fluctuations.¹

Less frequent dosing.

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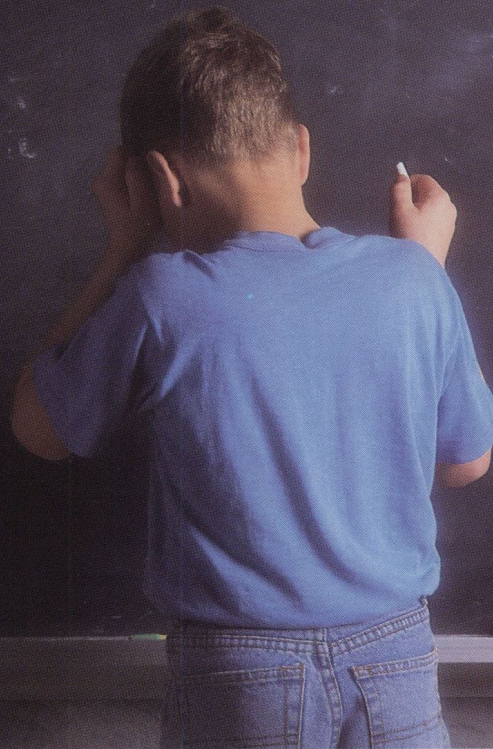
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Certains antiépileptiques peuvent réprimer plus que les crises.

Il arrive malheureusement que certains anti-épileptiques tels la phénytoïne affaiblissent la fonction cognitive.^(1,2,3,4)

D'autre part, Tegretol® CR (carbamazépine à libération contrôlée) a peu d'impact sur la fonction cognitive tout en procurant un excellent contrôle des crises.^(1,2,3,4)

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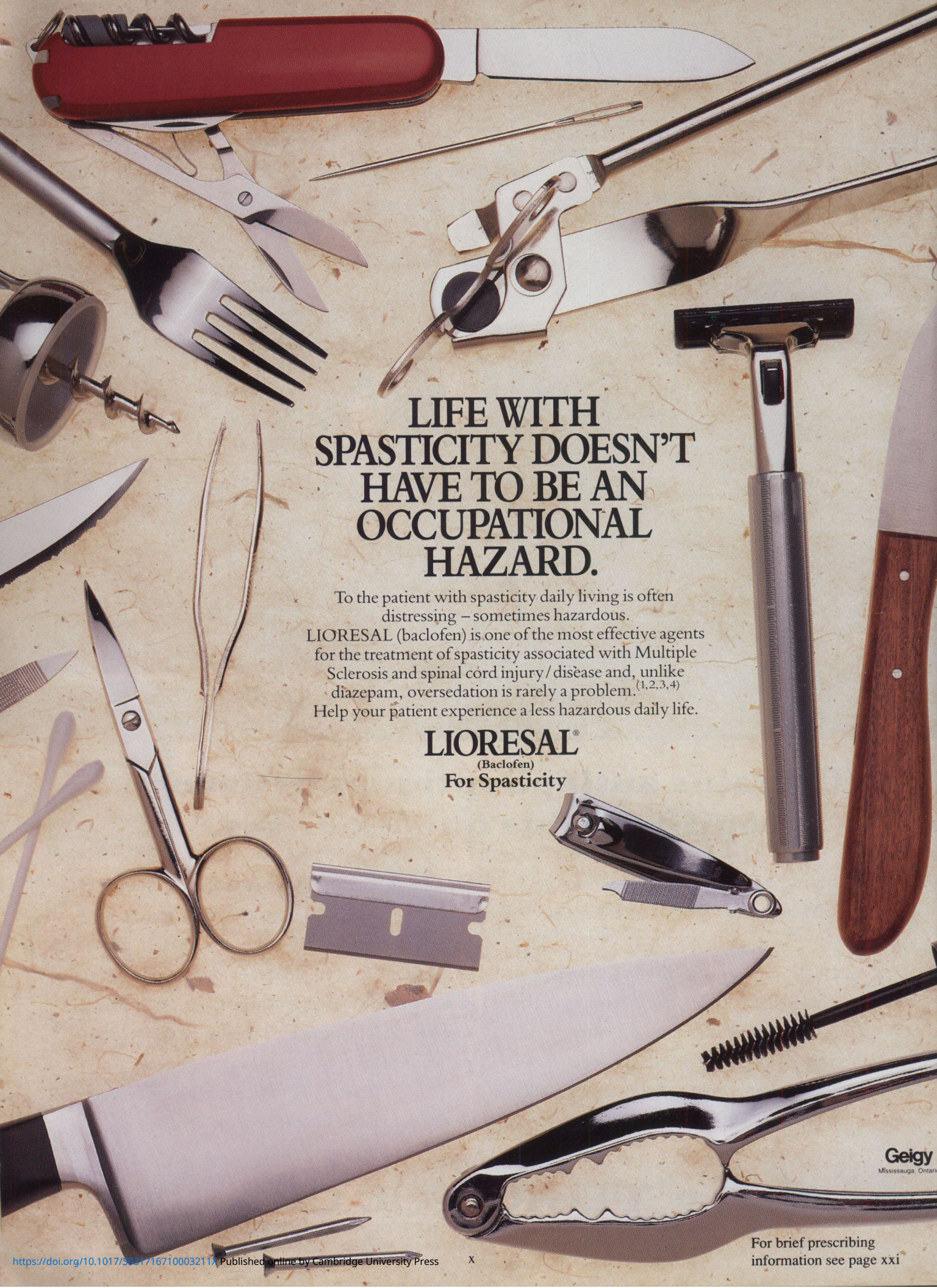
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Aide les épileptiques à réaliser leur plein potentiel.

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The Nicolet Spirit.[™]
 It brings new confidence to electrophysiologic analysis.



Introduci The risk of stroke h



ng Ticlid. as never been lower.

For TIA
and stroke patients,
Ticlid reduces the risk
47.6% more than ASA
in the first year.^{1,2}

➔ Ticlid is the first agent
proven more effective than ASA
in preventing initial stroke.¹ It is also
proven effective in preventing
recurrent non-cardiogenic stroke.³

During the first year of therapy
when patients are most at risk,⁴
Ticlid reduces the risk of initial
stroke by 47.6% relative to ASA.^{1,2}

Clearly, for TIA and stroke
patients the risk has never been
lower.^{1,3}

Ticlid[®]

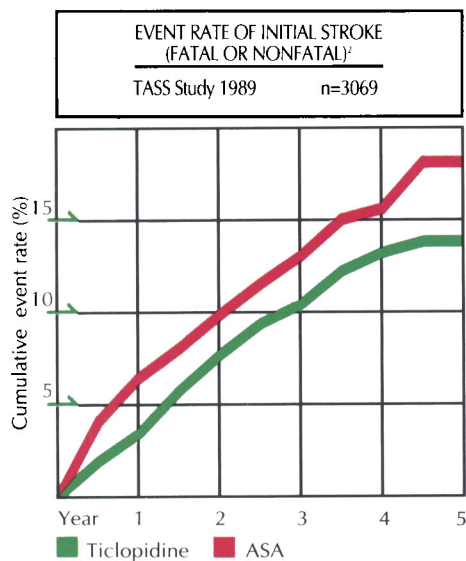
The risk of stroke has never
been lower.

Two landmark studies establish the superiority of ticlopidine in lowering the risk of recurrent stroke.

The first agent proven more effective than ASA in preventing initial stroke.

■ Ticlid (ticlopidine HCl) is a unique antiplatelet therapy that inhibits ADP-induced platelet-fibrinogen binding. Unlike ASA, Ticlid does not inhibit prostacyclin, thromboxane or prostaglandins.⁵

In the Ticlopidine Aspirin Stroke Study (TASS) involving 3,069 TIA and minor stroke patients, Ticlid was shown to reduce the risk of initial stroke by a considerable margin compared with ASA.¹



TICLID REDUCED THE RISK 47.6% RELATIVE TO ASA IN THE FIRST YEAR ($p=0.011$)²

“The benefit of ticlopidine was apparent early in the first year and persisted for the entire five years of follow-up.”

Ticlopidine Aspirin Stroke Study (TASS)
New England Journal of Medicine 1989

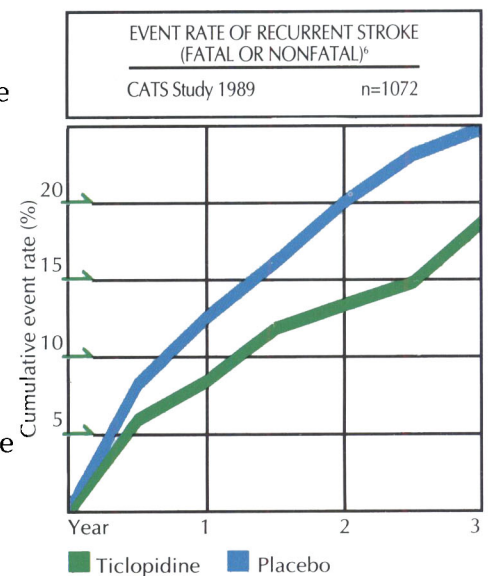
Proven effective in preventing recurrent stroke.

■ In the placebo-controlled Canadian American Ticlopidine Study (CATS), 1,072 patients who had experienced a recent thromboembolic stroke were treated and observed for up to 3 years.

Over the course of the study, Ticlid was shown to reduce the risk of non-cardiogenic stroke by 34%.⁶

“...the efficacy of ticlopidine was consistent and significant for both men and women.”

Canadian American Ticlopidine Study (CATS)
The Lancet 1989



TICLID REDUCED THE RISK 34% RELATIVE TO PLACEBO OVER 3 YEARS ($p=0.017$)⁶

Proven safety profile

■ The most common side effects were generally mild, transient and occurred early in therapy.⁵ Often they were resolved by a temporary dose reduction.¹

In both studies, severe neutropenia occurred in less than 1% of Ticlid patients and only during the first 3 months of therapy. It was always reversible upon discontinuation of therapy.^{1,3}

“...the benefits of ticlopidine clearly outweigh the associated risks.”

Canadian American Ticlopidine Study (CATS)
The Lancet 1989

ark studies r efficacy of Ticlid in risk of stroke.



TICLID IS INDICATED FOR PATIENTS WHO HAVE EXPERIENCED ANY OF THE FOLLOWING EVENTS:³

Transient Ischemic Attack (TIA)

Transient Monocular Blindness (TMB)

Reversible Ischemic Neurological Deficit (RIND)

Minor stroke (minimal deficit, >80% recovery)

Complete thromboembolic stroke

Blood monitoring is required every 2 weeks for the first 3 months of Ticlid therapy.

Dosage: 250 mg BID with meals

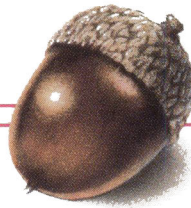
For information on this unique stroke prevention therapy, call the Ticlid Information Hotline 1-800-263-8918.

 SYNTEX®

Ticlid®

The risk of stroke has never been lower.

For brief prescribing information see page xix



VALPROATE: THE GROWTH OF EXPERIENCE IN PRIMARY GENERALIZED EPILEPSY

For years, valproate has been regarded as an excellent choice for the control of absence seizures.^{1,2}

In addition to its proven efficacy in simple and complex absence seizures,^{2,3} valproate has been shown to be as effective as previous standards in controlling primary generalized seizures with tonic-clonic manifestations.⁴ Epival* tablets have a special enteric-coating designed to reduce GI upset⁵ and are bioequivalent to Depakene*.⁶

Compared to most antiepileptics, Epival has been shown to have minimal effects on behaviour and cognition⁷ and relatively less interactions with commonly-prescribed medications.^{8,9}

Today's consensus favours monotherapy wherever possible. And no other single agent can provide this spectrum of efficacy in the management of primary generalized seizures.¹



Epival*
divalproex sodium

HELPING TO MEET TODAY'S THERAPEUTIC GOALS

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ABBOTT LABORATORIES, LIMITED
MONTREAL, CANADA

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