Table 1—*Major amputation in s-HBOT and non–s-HBOT groups stratified by vascular procedures*

	s-HBOT, *n* = 35		non–s-HBOT, *n* = 33	
	Vascular procedures, *n* = 13	No vascular procedures, *n* = 22	Vascular procedures, *n* = 13	No vascular procedures, *n* = 20
Amputated	2 (15.4)	1 (4.5)	4 (30.8)	7 (35.0)
Salvaged	11 (84.6)	21 (95.5)	9 (69.2)	13 (65.0)

Data are *n* (%). For vascular procedures, odds ratio 0.41, 95% CI 0.06–2.76, $P = 0.645$; for no vascular procedures, odds ratio 0.08, 95% CI 0.009–0.80, $P = 0.018$. *P* values measured by two-tailed Fisher's exact test.

HBOT group and the non–s-HBOT group, stratified according to the absence/presence of vascular procedures and to the result in major amputation.

From this analysis it could be deduced that the s-HBOT is not significantly useful in subjects who can undergo vascular procedures and that it is significantly useful in those who cannot undergo vascular procedures. This could be a secondary conclusion, in agreement with our main conclusion of the study. If one wants to calculate the odds ratio of major amputation in respect to vascular procedures alone (6:20 vs. 8:34), the result is odds ratio = 1.27, $P = 0.762$, 95% CI 0.38–4.20. So, the vascular procedures are not significantly associated with the prognosis, but the contribution of s-HBOT is clearly seen.

Furthermore, E. Chantelau asserts that arteriographies, presence of renal impairment, and claudication are differently distributed between the two arms. This statement is not supported by any statistically significant difference between the two arms. Obviously, the protocol of the clinical trial included that arteriography should be administered to all the patients with the same indications and restrictions. The arteriography was performed in the s-HBOT group on all 3 amputees (100%) and in 28 of the 32 salvaged patients (87.5%); and in the non–s-HBOT group on 10 of the 11 amputees (90.9%) and 16 of the 22 salvaged patients(72.7%).

We were astounded by the statement that "even in kidney failure, angiography may safely be performed if the contrast media is eliminated by hemodialysis afterwards." We do not ignore the possibility of performing an angiographic study submitting the patient to dialysis. We have done it with patients already in dialysis. We do not consider it to be ethical in subjects who are not in dialysis. As far as we are aware, there are no studies demonstrating that the limb can be salvaged with a similar approach in which risks, even quoad vitam, are not absent, especially in diabetic subjects with macroangiopathy. If this is E. Chantelau's usual practice, it would be useful to see the results published supporting this approach. Until this is done, at the moment we have no hesitation in not submitting subjects with creatinine >221 μmol/l to arteriography and in submitting them to amputation when necessary.

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Self-Monitoring of Blood Glucose Compared With Continuous Tissue Glucose Measurement

We read with great interest the article by Bolinder et al. (1) entitled "Self-monitoring of blood glucose in type 1 diabetic patients: comparison with continuous microdialysis measurements of glucose in subcutaneous adipose tissue during ordinary life conditions" (1) recently published in *Diabetes Care,* volume 20, 1997.

This study shows how actual self-monitoring of blood glucose (SMBG) does not necessarily reflect the daily glucose variations in intensely treated type I diabetic patients. The real need of a reliable glucose monitoring system, which registers all glucose variations, has been recognized for many years. In the past, diabetic patients used to control their glucose levels only once a month. Nowadays, with the implementation of intensified insulin therapy, a patient may measure his blood glucose 6–10 times a day. The trend in thinking "the more glucose levels you get, the better it is" is increasing. Nobody would question the benefits of continuous glucose monitoring.

Because of problems such as thrombus formation, coagulation, infection, and the fact that people cannot carry an intravenous device in daily life, subcutaneous tissue was seen as the most suitable place to perform the glucose monitoring because of its easy access and low immunological response (2). It has been shown that blood glucose changes are closely followed by corresponding tissue glucose changes with a time delay of 5 to 10 min (3–5). Moreover, it has been observed that a fall in tissue glucose (hypoglycohistiosis) may even precede a fall in blood glucose (hypoglycemia) (6).

In Ulm, Germany, we developed a Sugar-Watch-System that combines enzymatic-amperometric glucosensor with the microdialysis technique (4,5,7). We have been applying this technique since 1991 (7) and we can now successfully and continuously monitor on-line the tissue glucose changes in humans on a minute basis over a period of three consecutive days with only one calibration (8).

Our system is portable and weighs only ~250 mg. One remaining problem is having the patient implant the microdialysis probe into the subcutaneous tissue. The goal is to put this system into practice in the daily life of diabetic people. The patient would then not only be informed of his actual glucose level (glucose meter), but will also be warned of hypoglycemic or hyperglycemic episodes (alarm), and finally, insulin could be delivered according to the actual glucose level, thus completing in this way the missing link in the glucose-controlled insulin infusion (artificial endocrine pancreas).

We were surprised that the Stockholm Study Group was not aware of our development in this field.

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Response to Sternberg et al.

We appreciate the interest in our article concerning the reliability of self-monitoring of blood glucose (SMBG) in IDDM (1). As clearly stated in the report, the aim of the study was to evaluate whether or not frequent SMBG recordings (performed at least seven times a day) sufficiently mirror the true variations in diurnal glucose control in IDDM patients during ordinary life conditions. For this purpose, microdialysis measurements of glucose in subcutaneous adipose tissue were carried out as a reference method, thus allowing continuous monitoring of glucose control to be made in the ambulatory state (2). Hence, the objective was not to explore the potential clinical feasibility of the microdialysis glucose monitoring technique per se.

As recently reviewed by us (3), Sternberg et al., as well as other research groups, have made important and successful efforts to combine subcutaneous microdialysis with an extracorporeal enzyme-based electrochemical glucose sensor for on-line glucose monitoring and acoustic notification of hypoglycemia and hyperglycemia. To the best of our knowledge, however, we are not aware of any report by the Ulm Study Group or by others, in which SMBG and continuous microdialysis glucose monitoring profiles have been compared in a standardized way. Nevertheless, since our findings definitely demonstrate that the true variability in glucose control in most IDDM patients is too great to be reflected with accuracy even by frequent SMBG recordings, it is our hope that the ongoing developments of the microdialysis technique by different investigators in this area will lead in the near future to the introduction of a commercially available and easy-to-handle device for continuous glucose monitoring in IDDM patients.

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Choreoathetosis and Diabetes

Choreoathetosis is an uncommon disorder of movement that can occur in a variety of clinical settings that include Huntington's chorea, rheumatic fever, and several primary degenerative neurologic conditions and with certain pharmacological agents (e.g., neuroleptics). A patient with diabetes can manifest focal neurological abnormalities when his or her disease is out of control (diabetic ketoacidosis or hyperosmolar state). Chorea has not been previously described as a result of diabetes. Here, we present a patient who presented with generalized choreoathetosis due to diabetic ketoacidosis.

An 80-year-old white female was admitted to the hospital because of weakness, polyuria, and polydipsia, which had been progressive over the prior week. The patient's son had noticed bilateral dance-like movements of her upper extremities that had begun the previous evening. The patient herself was not bothered by this abnormality. Her past medical history was noteworthy only for type II diabetes and hypertension. There was no history of parkinsonism or rheumatic fever. She took only vasotec and gliburide. She had no allergies or any family history of degenerative neurological disorders.

She was afebrile with a heart rate of 54 bpm and a blood pressure of 100/74 mmHg. She was awake and alert with fluent speech. Her head and neck examination revealed dry mucous membranes, her lungs were clear, and her heart sounds normal. Her neurological evaluation was nonfocal with intact cranial nerves and normal sensation. She had poor motor control (fine and coarse) of the upper extremities bilaterally with dance-like flamboyant movements. Minimal sustained effort was sufficient to bring this out. There was minimal rigidity bilaterally. Laboratory evaluation showed a blood glucose of 928 mg/dl, the anion gap was 18, and an arterial blood gas (ABG) revealed a pH of 7.28, P_{CO_2} of 23 torr, and P_{O_2} of 289 torr on supplemental oxygen. A urinalysis showed many leukocytes and bacteria. A head computed tomography scan revealed only bilateral calcification of the basil ganglia and cerebellum, which can