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Heroin-assisted treatment: from efficacy to effectiveness and long-term outcome

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Chapter 4.

A patient perspective on heroin-assisted treatment.*

Abstract

AIMS: To describe subjective experiences of patients in heroin-assisted treatment (HAT). **DESIGN:** Qualitative study with open interviews at the start of HAT, after two, six, and 12 months of HAT, and two months after discontinuation of HAT. **SETTING:** Two HAT centers in two cities in the Netherlands. **PARTICIPANTS:** Twenty-four treatment-refractory heroin dependent patients in HAT. **INTERVENTION:** Patients were offered treatment with methadone plus injectable or inhalable heroin three times per day and seven days per week for six or 12 months. **FINDINGS:** Patients' experiences are described in terms of: (1) their subjective value and appreciation of the prescribed heroin, (2) the changes in the perceived availability of heroin and changes in their life structure during HAT and after discontinuation of HAT, and (3) the function of heroin (reinforcing effects) in their lives. **CONCLUSIONS:** Although patients differed in their appreciation of the prescribed heroin, all patients appreciated the guaranteed heroin availability, which in combination with the strict regime of HAT, enabled many patients to improve their daily life structure. Heroin had negative reinforcing effects for all patients. However, a subgroup of seven patients also mentioned positive reinforcing effects of heroin, and it was tentatively concluded that these patients tend to benefit most from HAT.

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4.1 Introduction

Just before the start of the heroin trials in the Netherlands, there were indications from a small randomized controlled trial (Perneger et al., 1998) and from a large naturalistic cohort study (Rehm et al., 2001) that supervised intravenous heroin-assisted treatment (HAT) might be a clinically effective and safe intervention for chronic, treatment-resistant heroin dependent patients. However, the Netherlands Health Council concluded that larger randomized trials were needed to establish the efficacy and safety of injectable and inhalable heroin before HAT could be introduced in the Netherlands as a routine clinical treatment (Health Council of the Netherlands, 1995). In 1998, the Dutch heroin trials were initiated, first in two cities. In May 1999, when the trials were extended from the two cities where they had started to their full-scale six cities design, it was also decided to start a small qualitative side-study in order to gain more insight into the processes contributing to the outcome of the study. It was assumed that the outcome of the RCTs could not be fully understood only by the quantitative trial-invoked difference between co-prescribed heroin without the need for illicit heroin use (experimental condition) *versus* ongoing methadone maintenance treatment and the use of illicit, street heroin (control condition). It was recognized that supervised HAT did not only offer patients pharmaceutical grade heroin, it also radically changed the situation in which heroin was acquired and administered by the patients.

In line with Zinberg's notion of "drug, set, and setting" as the three core aspects that determine the evolving patterns and consequences of alcohol and drug use (Harding, 1988; Zinberg, 1984; Zinberg et al., 1978), in this chapter on the patient perspective on HAT, we address the prescribed heroin as a specific drug, the patient participating in HAT, and the setting of HAT in which the patient had to administer the prescribed medication. First, we will describe the subjective value and appreciation of the prescribed heroin according to the participating patients, which, due to its pharmacologic purity, may differ from the effects of the (lower dosages of) impure and often contaminated illicit, street heroin. Second, with respect to the setting of HAT, we will focus on the changes in the perceived heroin availability and changes in life structure (Faupel, 1987) in relation to the participation in HAT. Finally, we will investigate the function of

heroin and other drug use, in terms of heroin's main reinforcing effects. A distinction will be made between (a) positive reinforcement, resulting in a pleasurable state or situation (e.g., feeling well, being stoned), and (b) negative reinforcement directed at the avoidance or removal of a negative state or situation (e.g., withdrawal, anxiety, stress). In this context, we will also try to classify the patients' heroin use as either operant behaviour (i.e., executed in order to invoke specific consequences) or respondent behaviour (i.e., automatic behaviour executed without conscious, explicit goals) (Korrelboom and Ten Broek, 2004).

4.2 Methods

4.2.1 Patients

Subjects for the qualitative study were patients enrolled in one of the HAT trials in the Netherlands (Blanken et al., 2005; Van den Brink et al., 2003) Patients participating in HAT in two cities (Rotterdam and Groningen) were approached after randomisation and before starting HAT. Patients were sampled balancing for group assignment (six or 12 months HAT), study protocol (inhalable *versus* injectable heroin), and gender. A total of 27 patients agreed to participate in the study. Two patients discontinued the study before they had started HAT: one patient got incarcerated and another patient moved abroad. A third patient discontinued HAT within three weeks and was interviewed infrequently. Because these three patients had no or very limited experience with HAT, they were excluded from the analyses, leaving a sample of 24 patients for the analysis.

All patients provided written informed consent with a protocol that had been approved by the national medical ethics committee (KEMO, later CCMO).

4.2.2 Data collection

Interviews took place prior to (or, in some cases, soon after) the start of HAT, two and - in case of a 12 months treatment offer - six months after the start of HAT, and prior to the protocolized discontinuation of HAT (6 or 12 months after the start of HAT). A final interview was held two months after discontinuation of HAT. Patients received € 15 remuneration per interview and a bonus of € 25 on

completing all five interviews. In order to interfere as little as possible with the main RCT, the total remuneration was made available 14 months after the baseline interview. Patients were offered a double remuneration (i.e., max. € 200) if they agreed the remuneration to be paid "in natura" (e.g., clothes, electronic equipment, furniture, et cetera).

4.2.3 Instruments

Interviews were semi-open and based on a topic-list, addressing:

- non-prescribed drug and methadone use (amount, route of administration, perceived availability, rituals);
- inter-relatedness between heroin and other drug use;
- setting (places, persons, times, situations, etc.) and (positive and negative) effects of drug use;
- living situation and daily activities (employment, illegal activities, sex work, etc.); and
- physical and mental health, and social functioning.

In general, interviews lasted between 60-120 minutes.

4.2.4 Analysis

All interviews were tape-recorded and transcribed verbatim. All interviews were coded (using "The Ethnograph", version 6.0) on the basis of the topic-list, with special focus on aspects of the relationship between HAT and (illegal) drug use, drug availability, life structure, control over drug use, and the functionality of heroin. Next, the coded interviews were summarised into idiosyncratic, patient descriptions, which led to classification of heroin's functionality (positive *versus* negative reinforcement; operant *versus* respondent behaviour) and an assessment of changes in life structure and control over drug use. Finally, based on a continuous comparison within and between cases, coherent patient groups were formed.

In addition, the following outcome parameters from the quantitative randomized controlled trials were matched to the study sample: self-reported heroin and cocaine use at baseline and month 12 study endpoint, treatment response in the domains of physical and mental health, and social functioning (involve-

ment in illegal activities, including sex work, and personal social contacts with non-drug using persons), and overall treatment response (Van den Brink et al., 2003).

4.3 Results

4.3.1 Patient characteristics

Table 1 summarizes some basic patient characteristics. Patients were between 30 and 52 years old (mean = 37.5 years). Seven patients were female (29%) and eight patients were homeless or lived in an unstable situation (33%). Sixteen patients were prescribed inhalable heroin (67%) and the other eight patients (33%) were prescribed injectable heroin.

4.3.2 Drug: medically prescribed heroin

The medically prescribed heroin was of pharmaceutical quality and had been tested extensively. Patients were not uniform in their appreciation. Some patients were (very) positive:

Well, in the beginning you get a 'flash', yes, and then, you'll get stoned from it. (...). Yes, just good quality. (respondent-15; interview #3).

The heroin from outside is more tasty. The quality, you know, there's grey heroin, brown. Outside, the grey one, that's the best. But the one here, you know, it's just one taste. It tastes like nothing, but you do get stoned. (respondent-01; interview #2).

Other patients were rather negative and complained about never getting stoned and only feeling very sleepy and lethargic:

The effect? Yes, well, when you smoke much of it, then you become sleepy. But the euphoric feeling, that comes along with street heroin, you don't get it. (respondent-05; interview #4).

Table 1. Patient characteristics according to type of reinforcement and type of drug use.

primary reinforcers	basic characteristics at start of HAT				life structure and drug use control			drug use and treatment response in HAT (RCTs' data)										
	patient	months	heroin type	sex	age	housing	life structure at start of HAT	outcome	control	M00 heroin	M12 heroin	M00 coke	M12 coke	physical	mental	illegal	social	res- ponse
positive reinforcement	opertant drug use	resp. 01	12	IH	m	39	U	++	↑	30	4	30	4	n.a.	n.a.	yes	n.a.	yes
		resp. 03	12	IH	f	39	S	+	↑	30	1	0	1	n.a.	n.a.	yes	n.a.	yes
		resp. 07	6	IH	f	37	S	++	↑	30	2	0	1	yes	n.a.	yes	no	yes
		resp. 08	12	IH	m	43	U	≈	↑	30	1	30	30	yes	n.a.	n.a.	n.a.	yes
		resp. 10	6	IH	m	52	S	≈	↑	30	2	2	1	n.a.	n.a.	n.a.	yes	yes
		resp. 20	6	IH	m	41	S	+	≈	30	0	26	0	n.a.	n.a.	yes	yes	yes
		resp. 21	12	IH	m	47	S	≈	↓	30	0	0	25	n.a.	n.a.	no	n.a.	no
		resp. 02	12	IV	m	40	S	-	≈	30	1	25	20	yes	yes	n.a.	n.a.	yes
		resp. 06	12	IV	m	40	S	≈	≈	28	2	0	0	no	no	n.a.	n.a.	no
		resp. 11	6	IH	m	37	S	≈	≈	14	0	10	9	no	n.a.	n.a.	n.a.	no
negative reinforcement	opertant drug use	resp. 12	12	IH	f	34	S	++	↑	27	0	27	0	yes	no	yes	no	yes
		resp. 14	6	IH	m	34	S	≈	↑	17	0	17	2	no	yes	n.a.	n.a.	yes
		resp. 16	6 *	IH	f	37	H	+	↑	24	0	30	23	no	no	n.a.	no	no
		resp. 22	12	IV	f	30	H	++	↑	24	1	24	2	no	yes	yes	yes	yes
		resp. 23	12	IV	m	37	S	+	≈	15	0	10	8	yes	n.a.	n.a.	n.a.	yes
		resp. 04	12	IV	f	33	S	++	↑	30	1	12	4	n.a.	n.a.	yes	yes	yes
		resp. 05	12 *	IH	m	33	S	+	↓	30	3	22	9	yes	yes	yes	no	yes
		resp. 09	6	IH	m	38	S	+	≈	12	0	2	9	no	no	n.a.	no	no
		resp. 13	12	IV	m	34	S	≈	≈	30	0	12	0	yes	yes	yes	no	yes
		resp. 15	6	IH	m	30	S	≈	↑	20	0	25	10	n.a.	n.a.	n.a.	no	no
		resp. 17	12	IV	f	33	H	+	≈	20	30	30	30	no	yes	no	no	yes
		resp. 18	6	IH	m	38	U	≈	≈	20	0	20	15	no	no	no	n.a.	no
		resp. 19	12	IV	m	34	U	≈	↓	20	3	10	15	no	no	no	yes	no
		resp. 24	12	IH	m	39	U	≈	≈	20	12	10	7	n.a.	no	yes	n.a.	no

Legend to table 1.

months	duration of heroin-assisted treatment in months * denotes premature treatment discontinuation
heroin type	IH = inhalable heroin prescription IV = injectable heroin prescription
sex	m = male f = female
housing	housing situation at start of HAT H = homeless U = unstable housing situation S = stable housing situation
life structure at start of HAT	
outcome	changes in life structure after 6 or 12 months HAT + = positive changes ≈ = (hardly) no changes - = negative changes
control	changes in control over heroin (and other drug) use during HAT ↑ = increased control over heroin (and other drug) use ≈ = (hardly) no changes in control over heroin (and other drug) use ↓ = reduced control over heroin (and other drug) use
M00 heroin	days self-reported heroin use at start of study
M12 heroin	days self-reported heroin use at 12-months study endpoint
M00 coke	days self-reported cocaine use at start of study
M12 coke	days self-reported cocaine use at 12-months study endpoint
physical	responder on physical health domain
mental	responder on mental health domain
illegal	responder on illegal activities
social	responder on domain of social contacts outside drug scene n.a. = not applicable, no problematic functioning at inclusion of study yes = improved (at least 40%), after problematic functioning at baseline no = not improved and ongoing problematic functioning since baseline
response	yes = treatment responder on dichotomous, multidomain outcome no = treatment non-responder on dichotomous, multidomain outcome

You get your heroin, that is to say, I do not consider it to be heroin, it has nothing to do with heroin ... You'll become just apathic. At least, that's my experience. I became completely apathic. (respondent-05; interview #4).

Some injecting patients complained about allergic reactions:

I had fixed my shot, and at some point in time, I had incredible lumps over here, red lumps everywhere. On my arms, on my chest, in my neck. (...) And then she [his girlfriend] said: "Well, if I were you, I would visit the doctor." I said: "Forget it, if I'd do that, he'll start talking about the dose being too high, and all that sort of things." (respondent-13; interview #3).

It should be noted, however, that patients' appreciation of the prescribed heroin can not easily be disentangled from the setting in which HAT is provided and administered and the consequences this has for the perceived effects and quality. For example, the drowsy and lethargic feeling is attributed by patients to the prescribed, pharmaceutical heroin, while it is not acknowledged that this feeling could also be related to the changes in drug consumption patterns (combined heroin and cocaine use is not allowed in HAT centres) and the changes in life structure resulting from participation in HAT. In addition, outside the HAT-setting patients usually smoked their street heroin very gradually, sometimes spreading small amounts over the day, while in the HAT-setting the prescribed inhalable heroin dose had to be "*chased*" within 30-40 minutes:

... the pattern of use has changed. I can no longer linger all day long, but I am bound by the opening hours of the program, see? (respondent-11, interview #4).

4.3.3 Setting: Heroin-Assisted Treatment

When patients started HAT, this changed the setting in which they had to obtain and administer their heroin completely, from an irregular, insecure and illegal situation to a highly regulated and structured, medical situation. Patients were offered pharmaceutical grade heroin three times a day for seven days per week, at regular times in the morning, afternoon and early evening. Prescribed heroin had to be injected or inhaled under medical supervision inside the treatment centres. The simultaneous or subsequent use of other drugs (e.g. cocaine and heroin) and drug sharing were not allowed in the treatment units. Two major consequences of this change in setting emerged from the interviews: the assured availability of heroin, and the effect of HAT on patients' life structure and

daily schedules.

Assured availability of heroin

One of the major benefits of participating in HAT is the assured availability of pharmaceutical grade heroin three times a day and seven days per week. Before participating in HAT, patients had to worry almost daily whether they would be able to obtain money to buy heroin (and cocaine). Once enrolled in HAT patients realized that the assured heroin availability had taken away their daily stress and worries about money:

Well, I liked it, yes. You have the certainty. That is a very prominent thing. That ... you don't have this fear anymore: "How do I get money or dope, today?" That's something you wake up with, every morning. That's just a fact. (respondent-21; interview #4).

I gained weight (...) and this has to do with the rest in your body. Everybody outside the program says to me: "You're not that speedy anymore, you're no longer that agitated. (respondent-16; interview #3).

Once the daily dose of heroin had been assured, patients either were able to "save" money or the necessity to "make" money became less urgent. Different responses were registered towards this new situation, both between patients and within patients. At times, the money that used to be spent on heroin was spent on other commodities:

Since I am here, I have spent between seven, eight hundred guilders [320-360 Euro] on books. I've bought clothes. I've bought stuff for my computer. You see, it's stuff that before ... it's about fifty to seventy-five guilders [25-35 Euro] a week, that I used to spend on heroin and that I can spend on other things now. (respondent-11; interview #4).

However, other patients or the same patients at other times spent the money they had saved on other drugs, most notably cocaine. This was most clearly shown on days that patients received their weekly or monthly (social or disablement) allowance:

Cocaine, I use for about three times per week. Yes, and then it's only about a quarter [of a gram], or two. And once a month, yes, I cash my allowance, 300 gulden [135 Euro], and then I get five grams and then: party! (respondent-19; interview #4).

For many patients, the increased availability of heroin also made it possible to strongly reduce or completely stop their involvement in prostitution, hustling or property crime:

Very occasionally it happens that I pick-up a "john" [a customer]. Sometimes, I walk through Main Street, I meet someone and then I take him. For the rest, I just have a surplus of money. If I happen to meet a dealer, I say: "Give me something". At other times, it also could happen that, all of a sudden, I'm on cocaine for three days. And then it is difficult to quit again. Sometimes I just give in to it, you just fall flat on your face, and then I stop again. (respondent-22; interview #3).

It's getting better now, anyway. It's only a small step, but it's only for six weeks now [that she is in the program]. They don't see me in the department store every day. They used to get really upset, as soon as they noticed me < laughs>. (respondent-04; interview #2).

I have changed my way of living, nowadays. (...). Before, life was just too fast, you know, now I want to live my life more slowly. (respondent-01; interview #4).

Other patients or the same patients at other times continued their involvement in prostitution, hustling or property crime. However, as can be seen from Table 1, 10 out of 14 patients (71%) that were enrolled in HAT also because of their involvement in illegal activities had reduced their illegal activities with at least 40%, including reduced sex work.

Regulating effect on life structure

Due to the supervised administration of prescribed heroin, patients had to visit the treatment centres (maximum three times per day and seven days per

week). The daily visits of the treatment centre could have a regulating effect on the daily life structure of patients. This structuring effect was potentially strongest among patients who were engaged in street-based, opportunistic activities like drug-dealing, hustling and sex work. Especially for sex workers, who usually work at night, the program requires them to change their day-night rhythm:

But now, I have to come here in the morning, the afternoon, the evening. So, I just live during the day, no longer at night anymore. And, I am happy with this daytime-life. I see the difference and I feel much healthier, too. (respondent-12; interview #2).

For patients who already lived a more or less structured life, the regulating impact of HAT was smaller and they easily adapted their daily schedule and the way they consumed heroin to the HAT-setting or they pragmatically adapted the frequency of their visits to the treatment centre to their daily life structure:

Yeah, usually I come in the morning and afternoon, because, if you go in the afternoon and evening, then there's very little time during the day, to do things at home, or make arrangements, or whatever needs to be done. (respondent-05, interview #2).

However, not all patients smoothly adapted their daily schedule to the program, or vice versa, and some complained about the straitjacket they felt forced into:

And sometimes I skip the afternoon-provision, because it's becoming too much, because I sell Street News, you know. So, when am I supposed to sell them? (...) No, it's quite a schedule to come here three times a day. (respondent-16; interview #3).

You hardly get involved in punishable activities anymore. Yeah, where I used to work [bouncer at drug dealing address], I don't work there anymore. You do get regularity in your life. But to come here [at the treatment centre] three times a day, at any cost, well that's quite a task. And then just sit and wait here. It takes most of the day. (respondent-20; interv. #3).

Patients that complained about the tight schedule of HAT were confronted with the dilemma of skipping a prescribed heroin dose or neglecting other important activities, while they don't want to miss either of them. Based on the qualitative interviews, it seems that about half of the patients experienced positive changes in their life structure and increased their control over heroin and other substance use during HAT (see table 1).

4.3.4 Set: Patients and heroin's reinforcing effects

Reinforcing effects of heroin use

As stated before, the reinforcing effects of self-administered heroin can be divided into positive and negative reinforcing effects. All patients enrolled in heroin-assisted treatment used illicit heroin on a nearly daily basis. The most obvious negative reinforcing effect of heroin among this group of chronic, treatment-resistant heroin addicts is the avoidance or relief of physical withdrawal:

When you're feeling cold, say, you're in withdrawal and, ... well, than you use some [heroin], you smoke a little. And then, it becomes active very soon, you get warm all over. And methadone is, well, is different. All the time, when I haven't smoked heroin, I think: There is something I need, I ... I need something, you know, like there's something I have forgotten. (respondent-20; interview #1).

In addition to the physical negative reinforcing effect, heroin also served as a psychological negative reinforcer, in terms of suppressing negative affect or traumatic memories, and as a means to be able to function at an acceptable level:

I really just need heroin in order not to be confronted with my past. That's just it, I have told you before. That still holds true, because if that falls away ... I fear my past, facing reality. Because, as I have said, with the incest, I exactly remember how it happened. So, therefore, I am afraid that those dreams will return. (respondent-03; interview #2).

If I don't use heroin, than I feel very lousy, I can't act like I would like to act, and that is: just getting along well enough, without being a nuisance to others, and without being bothered by others. (respondent-02; interview #1).

Another negative reinforcing effect was closely related to cocaine use. As can be seen from table 1, all but four patients (83%) also used cocaine, and the use of heroin and cocaine were closely intertwined. One of the possible side effects of (excessive) cocaine use is a feeling of agitation and restlessness. Heroin suppresses these negative feelings:

Yes, and if I use coke, without heroin, than I turn into a torpedo or something like that. I can't stand that. (respondent-20; interview #4).

I can't use cocaine without taking heroin thereafter, because I get so tense, I go through the roof. (respondent-11; interview #1).

Interestingly, before patients started participating in HAT, they often used illegal heroin and cocaine simultaneously or consecutively. However, the use of non-prescribed drugs is not endorsed in HAT and, therefore, some patients geared their cocaine use to the opening hours of the HAT program:

You know: "At four o'clock I have to go and smoke my heroin". So, then, at half past three, you try to smoke a little ball of white [approximately 100 mg cocaine], you understand? Because, if you don't have that combination, then you become paranoid. So, you make sure to have your little ball of white, because you know that within half an hour you'll have your dope [prescribed heroin]. (respondent-11; interview #1).

In addition to negative reinforcing capacities, heroin also has positive reinforcing effects. Many patients used heroin in order to experience the "flash" shortly after injecting heroin, and to get stoned and "feel well":

Yes, when I have real good quality, than I start feeling warm, something like goose pimples. (respondent-14; interview #2).

Well, not really stoned, like before, but you do feel good, not sick, mentally alert, you are able to do all kind of things. (respondent-24; interview #3).

Feeling well was also related to a social context, in which patients were engaged in work or leisure activities or social exchange with other - drug-using - persons.

When you want to feel well, yeah, then you have to <laughs> ... then you really have to, then you have to be with friends and you need to have enough to feel good, you know. (...) Then you have to smoke with friends, to make things nice and cosy. (respondent-01; interview #4).

4.3.5 Subgroups of patients

Based on the primary reinforcing effect of heroin use, two subgroups of patients could be distinguished: "pleasure appraisers" and "mood-managers"

Pleasure appraisers

The first group of seven patients can be characterized as heroin users who reported both positive and negative reinforcing effects of heroin. Although they had long histories of heroin use, and heroin was used because they were (physically) dependent, these patients still used heroin for its positive effects, and their heroin use, as well as the use of other substances could be classified as operant behaviour. Moreover, based upon the interviews, it can be tentatively concluded, that during HAT, the life structure of these "pleasure appraisers" had either stabilized or improved, while control over heroin and other substance use had mainly improved. In addition, all "pleasure appraisers" were *chasing the dragon*, and none of them had been enrolled in HAT because of mental health problems (table 1, columns 'heroin type' and 'mental'). Finally, all but one of the "pleasure appraisers" (86%) were responders to HAT, as defined in the RCTs.

Mood managers

The second group of patients is primarily characterized by negative reinforcing

effects of heroin. This is supported by the fact that three-quarters of the "mood managers" had been eligible for HAT because of their mental health status (13 out of 17; see table 1: column 'mental'). In this group, methadone and other downers, like alcohol and benzodiazepines, played an equally important role in coping with negative affect, emotions and trauma. Operant and respondent use of heroin and other substances was more or less balanced in this group of patients. Also in this group, life structure had stabilized or improved during HAT, but it seems that an improvement in the control over substance use was less pronounced among "mood managers" than among "pleasure appraisers". With respect to treatment response, table 1 shows that about half of the "mood managers" had responded ($9/17 = 53\%$), and that treatment response might be somewhat higher among operant "mood managers" ($5/8$ patients) than among respondent "mood managers" ($4/9$ patients), although the number of patients is very small.

4.4 Discussion

In this paper we have shown, based on qualitative accounts of patients participating in HAT, that although patients differ in their appreciation of the quality of the prescribed heroin, they all experienced the positive aspects of the assured heroin availability while in HAT. As a result of that, patients were able to spend money on other commodities and activities or, at times, on other drugs (most notably cocaine). The assured heroin availability, in combination with the strict regime of HAT, created for many patients the possibility to strongly reduce or discontinue their involvement in crimes against properties and street-based activities, like drug dealing, hustling, and sex work, thereby improving their daily life structure.

For most patients (71%), heroin and other drugs mainly functioned as a negative reinforcer in order to cope with emotional distress and trauma ("mood managers"). About half of them were responders to HAT. A second group of patients, however, also used heroin and other substances as a positive reinforcer in order to feel good ("pleasure appraisers"). Compared with the "mood managers", these "pleasure appraisers" were more likely to improve their control over drug use during HAT and all but one were responders to HAT.

In a recent review, Dutra and colleagues showed that, next to contingency management, cognitive behavioural therapy (CBT) is an effective treatment for substance dependent persons (Dutra et al., 2008). The tentative results of our study suggest that the reinforcers that contribute to the persistence of heroin and other drug use might play a role in increasing patients' control over drug use and treatment improvement. CBT is pre-eminently an intervention that addresses these behaviour reinforcers and could, therefore, be a useful supplemental psychosocial intervention to HAT.

In our small sample, improvement in life structure seemed related to a favourable treatment response, as well. In a number of studies, it has been shown that contingency management (CM), in addition to reduced substance use, can promote changes in life structure and non-drug related activities as well (DeFulio et al., 2009; Petry et al., 2006; Rogers et al., 2008). Currently, a trial is conducted in The Netherlands to evaluate whether CM is effective in reducing cocaine use among patients in HAT. The results of this qualitative study suggest that CM could also be applied to improve the life structure of patients in HAT.

This qualitative study has both strengths and limitations. The main strength is that the study has an open approach that allows new observations to become salient. The most important limitation is that it is based on a small number of patients in HAT, and although some of the results are striking, no firm final conclusions can be drawn. For instance, the potential differential effect of positive *versus* negative heroin reinforcement in terms of increased control over drug use and treatment response merit further exploration and testing in research and daily practice of HAT. Another limitation relates to the cognitive and verbal capacities of the patients in this study. The qualitative analyses were based upon the interview-transcripts and some patients were better equipped to talk about their drug consumption patterns, life structure, and functionality of heroin use than some others. Therefore, it can not be ruled out that some of the "mood managers" do experience positive reinforcement as well. On the other hand, we are fairly confident on the validity of the data, given for instance the discriminating relation between reinforcement type and mental health problems at the start of HAT.

We conclude that qualitative analyses of patient perspectives on HAT indicate that most patients experienced improvements in their life structure and their control over drug use. Compared with patients for whom heroin and other drugs function as a negative reinforcer, patients for whom heroin and other drugs have a positive reinforcing effect, seem to benefit more from HAT in terms of improved life style, increased control over drug use, and treatment response. Given these tentative results, evidence based psychosocial interventions, like CBT and CM, should be considered as additional interventions for patients in HAT to further improve the patients' life structure and control over non-prescribed drug use.