Opioid Addicts at Admission vs. Slow-Release Oral Morphine, Methadone, and Sublingual Buprenorphine Maintenance Treatment Participants

S. Giacomuzzi *, G. Kemmler *, M. Ertl *, Y. Riemer *

* University Department of Psychiatry, Innsbruck, Austria

Online Publication Date: 01 February 2006

To cite this Article Giacomuzzi, S., Kemmler, G., Ertl, M. and Riemer, Y.(2006)'Opioid Addicts at Admission vs. Slow-Release Oral Morphine, Methadone, and Sublingual Buprenorphine Maintenance Treatment Participants', Substance Use & Misuse, 41:2, 223 — 244

To link to this Article: DOI: 10.1080/10826080500391845
URL: http://dx.doi.org/10.1080/10826080500391845

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.informaworld.com/terms-and-conditions-of-access.pdf

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.
Opioid Addicts at Admission vs. Slow-Release Oral Morphine, Methadone, and Sublingual Buprenorphine Maintenance Treatment Participants

S. GIACOMUZZI, G. KEMMLER, M. ERTL, AND Y. RIEMER

University Department of Psychiatry, Innsbruck, Austria

With use of a randomized study design, quality of life (QOL) and physical symptoms of opioid addicts at admission were compared with slow-release oral morphine, methadone, and sublingual buprenorphine maintenance program participants after 6 months of treatment. The study was conducted from February to July 2004 in the outpatient drug user treatment center at University Department of Psychiatry at Innsbruck, providing maintenance treatment programs and detoxification in Tyrol, Austria. One hundred twenty opioid users seeking treatment were compared with 120 opioid-dependent patients retained for 6 months on a slow-release oral morphine, methadone, or sublingual buprenorphine maintenance program. The German version (“Berlin Quality of Life Profile”) of the Lancashire Quality of Life Profile was used, and illicit opioid use was determined by urinalysis. Physical symptoms were measured by using the Opioid Withdrawal Scale. Urinalyses revealed a significantly lower consumption of cocaine and opioids in all three substitution groups than in patients at admission (p < 0.001 and p ≤ 0.004, respectively). Both the buprenorphine and the methadone maintenance group showed significantly more favorable values than opioid clients at admission for stomach cramps (p ≤ 0.002), muscular tension (p ≤ 0.027), general pain (p ≤ 0.001), feelings of coldness (p ≤ 0.000), heart pounding (p ≤ 0.008), runny eyes (p ≤ 0.047), and aggressions (p ≤ 0.009). Patients who received slow-release oral morphine treatment generally showed the least favorable QOL scores compared with patients at admission or sublingual buprenorphine and methadone clients. Patients in the sublingual buprenorphine or methadone program showed nearly the same QOL scores. The buprenorphine and the methadone maintenance group showed significantly more favorable values than opioid clients at admission regarding leisure time (p ≤ 0.019), finances (p ≤ 0.014), mental health (p ≤ 0.010), and overall satisfaction (p ≤ 0.010). Slow-release oral morphine is a well-established treatment for pain, but more research is required to evaluate it as a treatment for heroin dependence. The present data indicate that slow-release oral morphine could have some disadvantages compared with sublingual buprenorphine and methadone in QOL, physical symptoms, and additional consumption. The results further suggest that buprenorphine treatment is as effective as methadone in effects on quality of life and physical symptoms.

Keywords quality of life; methadone; buprenorphine; slow-release oral morphine; addiction

Address correspondence to Dr. S. M. Giacomuzzi, Universitätsklinik Innsbruck-Ambulanz für Abhängigkeitserkrankungen, Anichstraße 35, 6020 Innsbruck, Austria. E-mail: salvatore.giacomuzzi@uibk.ac.at
Introduction

Quality of life (QOL) as an area of research has attracted a great deal of interest in the health sciences over the past 10 years (Bergner, 1989; Bigelow et al., 1990; Bigelow et al., 1991; Cella, 1994; Mast, 1995; McKellar, 1998; Leiß and Kallert, 2000). The literature acknowledges that such a concept has both a subjective and objective dimension. Subjective quality of life is about feeling good and being satisfied with things in general. Objective quality of life is about fulfilling the societal and cultural demands for material wealth, social status, and physical well-being (Noll, 1998).

In comparison with traditional clinical measures, QOL measures are usually more suitable for evaluating the social and emotional dimension of disease processes and treatment outcome and give an overall picture of how treatments or diseases are affecting the patient’s ability to function in life (Farquhar, 1995; Allison et al., 1997; Diener, 1999; Donald, 2001).

The quality of life concept has also been acknowledged as an important tool in the evaluation of drug user treatment programs (Torrens et al., 1997). However, until now there have been several attempts to assess the impact of opioid dependence and its treatment on the patients’ quality of life (Torrens et al., 1997, 1999; Vignau and Brunelle, 1998; Garg et al., 1999; Schwartz et al., 1999; Bell and Zador, 2000; Fischer et al., 2000; Giacomuzzi et al., 2001a, 2001b; 2003).

Opioid dependence is a common phenomenon that virtually confronts all countries in Europe (CIDAD, 2001). Heroin use has also been a major public health issue in Austria over the past decades. Methadone maintenance treatment has been demonstrated to be an effective medical treatment for opioid addiction and curbs the incidence of HIV (Dole and Nyswander, 1965; Newman, 1987; Caplehorn and Ross, 1995; Bertschy, 1995; Zaric et al., 2000). Although methadone maintenance treatment has been successfully used in a large number of drug substitution programs worldwide, it has the disadvantage of being associated with a number of side effects. Methadone side effects include but are not limited to drowsiness, lightheadedness, weakness, dry mouth, urinary retention, constipation, and slow or troubled breathing (Kolar et al., 1990; Schoenbaum and Selwyn, 1995; Scherbaum et al., 1996; Giacomuzzi et al., 2001a, 2001b; Ortner et al., 2001).

Sublingual buprenorphine has been proposed as a new therapy that could help those who are not already receiving treatment, stem the incidence of HIV and other diseases, and help alleviate other problems resulting from opioid abuse. Sublingual buprenorphine also has some advantages over methadone. Most notably, buprenorphine has a ceiling level on agonist activity, limiting adverse reactions at very high doses (Jasinski et al., 1978; Bickel and Amass, 1995; Walsh et al., 1995). Some study results suggest that a twice-weekly dosing regimen may also be possible (Petry et al., 2000, 2001). In several studies, sublingual buprenorphine was found to be nearly as effective as methadone and a useful alternative for maintenance and detoxification therapy of opioid-dependent subjects (Kosten et al., 1993; Strain et al., 1994; Ling et al., 1996, 1998; Fischer et al., 1998, 1999; West et al., 2000; Barnett et al., 2001a, 2001b; Gandhi et al., 2003; Giacomuzzi et al., 2003).

Nowadays, apart from methadone and sublingual buprenorphine, another substitution medication is prescribed especially in Austria for opioid treatment, such as long-acting morphine (retarded or slow-release oral morphine).

Slow-release oral morphine is an opioid agonist with a 12- to 24-hour duration of action. It is indicated for use as a maintenance treatment. The slow-release form overcomes many of

1Editor’s note: The journal’s style uses the category substance abuse as a diagnostic category. Substances are used or misused; living organisms are and can be abused.
the disadvantages of the short-acting nature of morphine, so theoretically it should have the same treatment effects as methadone, without some of methadone’s disadvantages. Slow-release oral morphine has been proposed as an alternative maintenance pharmacotherapy to methadone or sublingual buprenorphine for treatment of opioid dependence (Sherman, 1996; Kragher et al., 2002). There has been little research on slow-release oral morphine for maintenance therapy (Derks, 1990; Sherman, 1996; Schneider et al., 1996; Ritter et al., 1997; Fischer et al., 1998; Fischer et al., 1999a, 1999b; Grunberger et al., 2000; Rohrmeister et al., 2001; Giacomuzzi et al., 2001a, 2001b; Kragher et al., 2002; Pezawas et al., 2002). Morphine is usually not administered at our department to children under the age of 18 years, in respiratory depressions, and in the presence of acute alcoholism.

Despite changes regarding the use of slow-release oral morphine and sublingual buprenorphine, outcomes have rarely been studied systematically, and studies focusing on QOL at admission and in different maintenance treatment programs for drug addicts are virtually nonexistent (Franques et al., 1997; Torrens et al., 1997; Fischer et al., 2000; Habrat et al., 2002; Giacomuzzi et al., 2003).

Drug addicts at admission can show poor social integration, low QOL scores and multiple corresponding deficiencies (Dobler-Mikola and Zimmer-Hofler, 1993; Reno and Aiken, 1993; Habrat et al., 2002). Especially the comparison between addicts at admission and maintenance program participants gives an opportunity to compare treatment outcomes in terms of QOL and physical symptoms (Habrat et al., 2002).

The methadone, slow-release oral morphine, and buprenorphine maintenance treatment are designed to reduce illegal and harmful opioid use (e.g., heroin, codeine, dilaudid, oxycodone, retard. morphine) along with the many problems (e.g., crime, disease, death) associated with this addiction. The treatments are multidisciplinary in itself; this means that methadone, slow-release oral morphine, or buprenorphine maintenance are not the only treatment but that other needs of the patient, whether they are medical, social, legal, psychiatric, or something else, are addressed at the same moment. The main outcome of these treatment interventions is a decrease or even elimination of opioid use to help stabilize the individuals so that they will not return to previous substance use behavior patterns. Main aims are maintenance rather than abstinence. Abstinence may be a long-term goal. Retention rates are normally about 80% and are influenced by dose, psychosocial functioning, and not by psychiatric comorbidity (Gerra et al., 2004a).

The present study carried out at the Department of Psychiatry at Innsbruck University Hospital was therefore designed to compare quality of life ratings, physical symptoms, and urinalyses of opioid addicts at admission with slow-release oral morphine, methadone, and buprenorphine maintenance program participants.

Methods

Study Design and Inclusion/Exclusion Criteria

On entry into the study, all subjects underwent a medical and psychiatric examination and urine screening. Patients were randomized to receive methadone, buprenorphine, or slow-release oral morphine treatment.

Patients were eligible for the study if they had a current diagnosis of opioid dependence based on the criteria in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders DSM IV at admission or were in a methadone, sublingual buprenorphine, or slow-release oral morphine maintenance program for 6 months; were aged 17 years or
older; lived within commuting distance of the hospital; and were mentally competent to give informed consent.

Patients were excluded from the study if they had an acute medical condition at 6 months of treatment were currently using antipsychotic medication, or were in another clinical trial.

Forced discharge criteria were limited to drug trafficking in the clinical center or aggressive behavior.

**Sample**

One hundred twenty opioid users seeking treatment were compared with 120 opioid-dependent patients retained for 6 months on a slow-release oral morphine, methadone, or sublingual buprenorphine maintenance program. Demographic and clinical data are documented in Table 1. Patients at admission had been using heroin for an average of 8.1 years (SD 5.6), slow-release oral morphine program participants for an average of 9.0 years (SD 6.2), methadone clients for an average of 8.2 years (SD 7.1), and sublingual buprenorphine program clients for an average of 8.7 years (SD 6.4). Since the introduction of

<table>
<thead>
<tr>
<th>Demographic and medical data</th>
<th>Methadone (N = 40)</th>
<th>Buprenorphine (N = 40)</th>
<th>Slow-release oral morphine (N = 40)</th>
<th>At admission (N = 120)</th>
<th>p-Value between all groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>57</td>
<td>57</td>
<td>57</td>
<td>63</td>
<td>0.786</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>27.3 ± 6.4a</td>
<td>26.3 ± 7.5</td>
<td>27.8 ± 4.8</td>
<td>25.3 ± 7.1</td>
<td>0.039</td>
</tr>
<tr>
<td>Length of addiction (yr)</td>
<td>8.2 ± 7.1</td>
<td>8.7 ± 6.4</td>
<td>9.0 ± 6.2</td>
<td>8.1 ± 5.6</td>
<td>0.105</td>
</tr>
<tr>
<td>Medical status (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV</td>
<td>3</td>
<td>0.0</td>
<td>3</td>
<td>4</td>
<td>0.654</td>
</tr>
<tr>
<td>HBV</td>
<td>20.0</td>
<td>12.0</td>
<td>17</td>
<td>15</td>
<td>0.655</td>
</tr>
<tr>
<td>HCV</td>
<td>57</td>
<td>70</td>
<td>70</td>
<td>66</td>
<td>0.359</td>
</tr>
<tr>
<td>Finances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income per month (€)</td>
<td>617 ± 4210</td>
<td>668 ± 3052</td>
<td>491 ± 2100</td>
<td>813 ± 1342</td>
<td>0.325</td>
</tr>
<tr>
<td>Family status(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single/divorced</td>
<td>56.7</td>
<td>70</td>
<td>60</td>
<td>77.7</td>
<td>0.234</td>
</tr>
<tr>
<td>Partner</td>
<td>43.3</td>
<td>30.0</td>
<td>40.0</td>
<td>22.3</td>
<td></td>
</tr>
<tr>
<td>Security and law(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accusation of punishable actions</td>
<td>40</td>
<td>33</td>
<td>50</td>
<td>51</td>
<td>0.342</td>
</tr>
<tr>
<td>Victim of a crime</td>
<td>23</td>
<td>13</td>
<td>13</td>
<td>29</td>
<td>0.468</td>
</tr>
<tr>
<td>Police or legal assistance not received</td>
<td>17</td>
<td>17</td>
<td>14</td>
<td>13</td>
<td>0.574</td>
</tr>
</tbody>
</table>

\( \text{mean} \pm \text{SD.} \)
slow-release oral morphine for opioid substitution in 1999, most of the opioid clients in Austria tend to develop a morphine addiction (BMGF, 2002). The opioid-dependent individual in Austria, as referred here, is rather physically dependent on morphine (slow-release oral morphine) than on heroin. Therefore, the Austrian situation is unique compared with other European countries. The use of slow-release oral morphine by opioid-dependent individuals is a “street phenomenon” that has received clinical attention in Austria (Scholz, 2004). The increase in the use of morphines over the period 2000–2003 occurred in Austria about 6 months after their introduction in 1999 as a maintenance substance for opioid addiction.

**Ethics**

Informed consent was obtained from all participants. Because all participants entered a normal methadone, sublingual buprenorphine, or slow-release oral morphine program, there was no need to approve the study by the human subject ethical committee. Although participants did not experience financial issues, every patient had the possibility to discuss their own study results with a psychological-social counseling services.

**Rating Instruments**

Within 2 weeks after admission or being 6 months in a methadone, sublingual buprenorphine, or slow-release oral morphine maintenance program, clients completed the German version (“Berlin Quality of Life Profile”) of the Lancashire Quality of Life Profile, a well-established psychometrically validated QOL assessment instrument and were interviewed by a trained staff member (Oliver, 1991; Oliver et al., 1996).

The Lancashire Quality of Life Profile was chosen because it pays specific attention to patients’ definition of quality of life (autonomy, coping, self-worth) (van Nieuwenhuizen et al., 2001). The Lancashire Quality of Life Profile is a structured interview designed to investigate both global well-being and well-being in individual life domains. The instrument covers the following areas: demographic data, overall quality of life, vocational issues, leisure time, religion, finances, housing, law and security, family, self-esteem, friends and acquaintances, and mental and physical health (Priebe et al., 1995; Huxley et al., 1997, 2001). This instrument is now widely used in Europe, and a number of different versions have been developed following a common methodology (van Nieuwenhuizen et al., 2001; Ruggeri et al., 2001). It has proved to be psychometrically valid, reliable, and responsive to changes over a wide range of quality of life and health status, as well as appropriate for the evaluation of medical and social interventions as an outcome measure for group comparisons (van Nieuwenhuizen et al., 2001; Ruggeri et al., 2001; Ritsner et al., 2001).

In addition, a questionnaire was used to register the patients’ specific demographic characteristics (e.g., length of heroin use). Presented physical symptoms were measured by using the Opioid Withdrawal Scale (Bradley et al., 1987; Gossop et al., 1987; Gossop, 1990). The Opioid Withdrawal Scale provides an objective measure of the severity of physical symptoms. This tool can also be used as part of initial assessments, for ongoing monitoring to assess the patient’s response to medication (Bradley et al., 1987; Gossop et al., 1987). The patient scores down presented columns of physical symptoms placing a score from 0 to 1 (symptom present or absent) for each item. A total score for all items can be computed, if necessary.
Urine screening tests were carried out at random time intervals to detect additional consumption. Urine samples of each maintenance treatment client were taken three times within the last 8 weeks of the study period and were always temperature-tested. Patients with positive urine toxicology results were not retested more often. All urine samples were tested at the Institute of Legal Medicine in Innsbruck. Urine tests were analyzed for cocaine, benzodiazepine, amphetamine, and opioids. A total number of 480 urine screening tests were carried out.

When patients entered a normal methadone, sublingual buprenorphine, or slow-release oral morphine program, they were asked to participate in the study. The investigations were therefore conducted always with the patients’ agreement at the University Department of Psychiatry by one of the authors. Patients were free to refuse the investigation.

Substitution Programs and Clinical Procedures

An open-label, flexible dosing regimen based on a methadone, slow-release oral morphine, or sublingual buprenorphine program was used, with increasing doses depending on the severity of withdrawal symptoms and the patient’s opinion during the induction period of 6–7 days to a stable dose thereafter. During induction, 10–30 mg methadone, 60–180 mg slow-release oral morphine, and 2–8 mg sublingual buprenorphine was given on the first day. Methadone, slow-release oral morphine, and sublingual buprenorphine always had to be ingested in the presence of a nurse or in a pharmacy. All subjects received take-home doses only on weekends. Benzodiazepines were generally not prescribed for these patients at our department.

The clinical management included follow-up visits providing both psychosocial support (housing, debts, psychological counseling) and assessing the patient’s medical condition and treatment response (e.g., craving, etc.). Patients were always tested for HIV and hepatitis infection during the first 2 weeks after inclusion in the program.

Statistical Analysis

Statistical analysis was performed by using SPSS, version 11.5. In view of the moderate sample size and the fact that many scales were not normally distributed, nonparametric tests were used throughout the analysis. The $\chi^2$-test was applied to compare the treatment groups with respect to demographic or dichotomic data and urinalysis results. The quality of life scores were compared by Kruskal-Wallis test (between all treatment groups), followed by Mann-Whitney U tests (post hoc between two treatment groups). Furthermore, an analysis of covariance was performed to adjust quality of life scores for possible effects of age, length of addiction, medical status, job, and polytoxicomanic drug use (an appropriate transformation of the data to approximate normality was applied, where necessary). All these procedures were calculated at the level of significance 0.05 (alpha = 0.05). Bonferroni adjustment was applied for QOL scores.

Results

Sample Characteristics

Except age ($p = 0.039$), there were no statistically significant differences between the different study groups in the patient demographic characteristics (Table 1).
One hundred twenty opioid users seeking a maintenance treatment program with an average age of 25.3 years (SD 6.1) were compared with 120 opioid-dependent patients retained for 6 months on a slow-release oral morphine (40 patients; average age 27.8; SD 4.8), methadone (40 patients; average age of 27.3; SD 6.4) and sublingual buprenorphine (40 patients; average age 26.3; SD 7.5) maintenance program. Fifty-seven percent of the participants on a maintenance program were male, and 63% at admission.

No significant differences were found in HIV, HBV, or HCV infection rates between the four groups. During the study period, the mean methadone dose was 38.66 ± 20.73 mg (range = 5–135 mg), the mean slow-release oral morphine dose was 234.66 ± 189.55 mg (range = 60–800 mg), and the mean buprenorphine dose was 9.34 ± 8.21 mg (range = 2–32 mg).

**Urinalyses**

A total number of 480 urine screening tests (120 at admission; 360 during the last 8 weeks of maintenance treatment) were carried out to detect additional consumption. Figure 1 shows that significant differences between the groups’ additional consumption were observed.

Post hoc paired group comparisons showed statistically significant differences between clients at admission and slow-release oral morphine maintenance treatment in consumption of cocaine ($p < 0.001$) and opioids ($p < 0.001$), in which the patients of the slow-release...
Table 2

Percentage of physical symptoms

<table>
<thead>
<tr>
<th>Physical symptoms(^a)</th>
<th>Methadone (N = 40)</th>
<th>Buprenorphine (N = 40)</th>
<th>Slow-release oral morphine (N = 40)</th>
<th>At admission (N = 120)</th>
<th>(p)-Value between all groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach cramps</td>
<td>17</td>
<td>13</td>
<td>47</td>
<td>47</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Twitching of muscles</td>
<td>30</td>
<td>37</td>
<td>23</td>
<td>52</td>
<td>0.017</td>
</tr>
<tr>
<td>Fatigue or tiredness</td>
<td>50</td>
<td>30</td>
<td>80</td>
<td>64</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Runny eyes</td>
<td>23</td>
<td>17</td>
<td>33</td>
<td>43</td>
<td>0.029</td>
</tr>
<tr>
<td>Inability to fall asleep</td>
<td>36</td>
<td>47</td>
<td>70</td>
<td>63</td>
<td>0.018</td>
</tr>
<tr>
<td>Insomnia</td>
<td>40</td>
<td>40</td>
<td>67</td>
<td>56</td>
<td>0.467</td>
</tr>
<tr>
<td>Vomiting</td>
<td>17</td>
<td>27</td>
<td>33</td>
<td>41</td>
<td>0.076</td>
</tr>
<tr>
<td>Nervousness</td>
<td>37</td>
<td>60</td>
<td>57</td>
<td>73</td>
<td>0.003</td>
</tr>
<tr>
<td>Aggressions</td>
<td>20</td>
<td>23</td>
<td>40</td>
<td>50</td>
<td>0.006</td>
</tr>
<tr>
<td>Anxiety</td>
<td>40</td>
<td>33</td>
<td>43</td>
<td>44</td>
<td>0.562</td>
</tr>
<tr>
<td>Depressions</td>
<td>47</td>
<td>37</td>
<td>67</td>
<td>57</td>
<td>0.084</td>
</tr>
<tr>
<td>Libido disturbance</td>
<td>40</td>
<td>33</td>
<td>67</td>
<td>45</td>
<td>0.055</td>
</tr>
<tr>
<td>Potency disturbance</td>
<td>17</td>
<td>17</td>
<td>23</td>
<td>16</td>
<td>0.324</td>
</tr>
<tr>
<td>Poor appetite</td>
<td>43</td>
<td>33</td>
<td>60</td>
<td>51</td>
<td>0.289</td>
</tr>
<tr>
<td>Constipation</td>
<td>37</td>
<td>20</td>
<td>40</td>
<td>42</td>
<td>0.315</td>
</tr>
<tr>
<td>Itching</td>
<td>23</td>
<td>27</td>
<td>10</td>
<td>36</td>
<td>0.041</td>
</tr>
<tr>
<td>Feelings of coldness</td>
<td>23</td>
<td>27</td>
<td>30</td>
<td>66</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Heart pounding</td>
<td>17</td>
<td>10</td>
<td>30</td>
<td>42</td>
<td>0.002</td>
</tr>
<tr>
<td>Muscular tension</td>
<td>23</td>
<td>30</td>
<td>37</td>
<td>52</td>
<td>0.012</td>
</tr>
<tr>
<td>General aches and pains</td>
<td>13</td>
<td>20</td>
<td>33</td>
<td>53</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yawning</td>
<td>50</td>
<td>30</td>
<td>23</td>
<td>54</td>
<td>0.006</td>
</tr>
</tbody>
</table>

\(^a\)Physical symptoms scored from 0 to 1 (symptom present or absent).

oral morphine group showed the more favorable values. Sublingual buprenorphine and methadone maintenance treatment showed the more favorable values compared with clients at admission regarding consumption of cocaine \((p \leq 0.000)\) and opioids \((p \leq 0.004)\).

**Physical Symptoms**

The outcome measures for physical symptoms are noted in Table 2, which shows that statistically significant differences between the four groups were observed for all symptoms except insomnia, anxiety/depression, potency dysfunctions and certain gastrointestinal disturbances (poor appetite, constipation, und vomiting).

Post hoc paired group comparisons showed no statistically significant differences between methadone clients and the sublingual buprenorphine group in physical symptoms. Both the buprenorphine and the methadone maintenance group showed significantly fewer stomach cramps \((p \leq 0.002)\), muscular tension \((p \leq 0.027)\), general pain \((p \leq 0.001)\), feelings of coldness \((p \leq 0.000)\), heart pounding \((p \leq 0.008)\), runny eyes \((p \leq 0.047)\), and aggression \((p \leq 0.009)\) than opioid clients at admission. In addition, the methadone-maintained group showed significantly less inability to fall asleep \((p = 0.010)\),
twitching of muscles \( (p = 0.014) \), and nervousness \( (p < 0.001) \) compared with clients at admission, whereas patients treated with sublingual buprenorphine exhibited less fatigue or tiredness \( (p = 0.001) \) and yawning \( (p = 0.017) \) than clients at admission.

Differences between slow-release oral morphine maintenance treatment and clients at admission were statistically significant in twitching of muscles \( (p = 0.003) \), itching \( (p = 0.006) \), feelings of coldness \( (p < 0.001) \), general pains \( (p = 0.038) \), and yawning \( (p = 0.002) \), in which patients of the morphine treatment showed the more favorable values.

Buprenorphine- and methadone-treated patients showed significantly more favorable values than the group maintained with slow-release oral morphine for stomach cramps \( (p \leq 0.013) \), fatigue or tiredness \( (p \leq 0.015) \), yawning \( (p \leq 0.035) \), and insomnia \( (p \leq 0.041) \).

In addition, the methadone group had fewer problems with falling asleep than the group treated with slow-release oral morphine \( (p = 0.009) \), and the sublingual buprenorphine group showed significantly less depression than the oral morphine group \( (p = 0.023) \).

**Subjective Scores of the Lancashire Quality of Life Profile**

For the assessed life domains as well as for overall life satisfaction, statistically significant differences between the four groups were found (Table 3).

Both the buprenorphine and the methadone maintenance group showed significantly more favorable values than opioid clients at admission regarding leisure time \( (p \leq 0.019) \), finances \( (p \leq 0.014) \), mental health \( (p \leq 0.010) \), and overall satisfaction \( (p \leq 0.010) \). In addition, the methadone maintenance group showed significantly higher QOL scores than patients at admission in the domains of housing \( (p < 0.001) \) and self-esteem \( (p = 0.001) \).

**Table 3**

Subjective scores of the Lancashire Quality of Life Profile

<table>
<thead>
<tr>
<th>Satisfaction scores of different domainsa</th>
<th>Methadone ( (N = 40) )</th>
<th>Buprenorphine ( (N = 40) )</th>
<th>Slow-release oral morphine ( (N = 40) )</th>
<th>At admission ( (N = 120) )</th>
<th>( p )-Value between all groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job</td>
<td>5.1 ± 2.1b</td>
<td>3.8 ± 3.4</td>
<td>4.2 ± 1.9</td>
<td>4.4 ± 2.3</td>
<td>0.007d</td>
</tr>
<tr>
<td>Leisure time</td>
<td>5.4 ± 1.4</td>
<td>4.9 ± 1.4</td>
<td>3.7 ± 1.5</td>
<td>3.9 ± 1.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Finances</td>
<td>4.4 ± 2.1</td>
<td>4.2 ± 1.7</td>
<td>2.6 ± 1.5</td>
<td>3.1 ± 1.9</td>
<td>0.001</td>
</tr>
<tr>
<td>Housing</td>
<td>6.1 ± 0.8</td>
<td>5.5 ± 1.2</td>
<td>4.7 ± 1.4</td>
<td>4.6 ± 1.7</td>
<td>0.001</td>
</tr>
<tr>
<td>Law and security</td>
<td>5.6 ± 1.1</td>
<td>5.7 ± 1.3</td>
<td>5.2 ± 1.3</td>
<td>5.1 ± 1.4</td>
<td>0.039</td>
</tr>
<tr>
<td>Family</td>
<td>5.8 ± 1.4</td>
<td>5.1 ± 2.0</td>
<td>3.6 ± 2.1</td>
<td>4.5 ± 1.9</td>
<td>0.002</td>
</tr>
<tr>
<td>Partnership</td>
<td>5.7 ± 1.9</td>
<td>5.5 ± 1.8</td>
<td>4.2 ± 2.3</td>
<td>4.8 ± 1.8</td>
<td>0.023</td>
</tr>
<tr>
<td>Friends and acquaintances</td>
<td>5.6 ± 1.2</td>
<td>5.4 ± 1.7</td>
<td>4.4 ± 1.3</td>
<td>5.0 ± 1.5</td>
<td>0.009</td>
</tr>
<tr>
<td>Physical health</td>
<td>5.2 ± 1.4</td>
<td>4.8 ± 1.6</td>
<td>3.3 ± 2.3</td>
<td>3.2 ± 1.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>5.0 ± 1.5</td>
<td>4.7 ± 1.6</td>
<td>3.4 ± 1.7</td>
<td>3.7 ± 1.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-esteemc</td>
<td>8.2 ± 1.8</td>
<td>7.2 ± 2.8</td>
<td>5.7 ± 2.7</td>
<td>6.1 ± 2.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>5.3 ± 1.5</td>
<td>4.9 ± 1.4</td>
<td>4.1 ± 1.7</td>
<td>3.5 ± 1.6</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

aSatisfaction scores range 1–7.
bMean ± SD.
cSatisfaction score range 1–10.
dSignificant \( p \)-values after Bonferroni correction \( (\text{with } p \leq 0.05/12 = 0.00416^*\) are shown in bold print.
Patients who received slow-release oral morphine treatment generally showed less favorable values than patients at admission or sublingual buprenorphine and methadone clients.

Patients in the sublingual buprenorphine or methadone program showed nearly the same quality of life scores. Post hoc paired group comparisons showed a statistically significant difference between the methadone and sublingual buprenorphine group for the job satisfaction subscale ($p = 0.029$), in which the patients in the methadone group showed the more favorable values.

Methadone- and buprenorphine-maintained groups showed significantly more favorable values for finances ($p \leq 0.010$), family ($p \leq 0.044$), and overall satisfaction ($p \leq 0.031$) compared with slow-release oral morphine clients.

Furthermore, the methadone-maintained group showed significantly more favorable values for leisure time ($p < 0.001$), housing ($p = 0.023$), partnership ($p = 0.034$), friends and acquaintances ($p = 0.003$), mental health ($p = 0.002$) and self-esteem ($p = 0.002$) compared with the slow-release oral morphine clients.

A statistically significant difference between buprenorphine and slow-release oral morphine maintenance treatment was found for physical health ($p = 0.043$), in which the patients of the buprenorphine group showed the more favorable values.

Results remained unchanged when an adjustment by analysis of covariance was made for age, length of addiction, maintenance dosage, medical status, job, and polytoxicomanic drug use.

**Discussion**

Because only a few studies are available focusing on drug addicts, this study is one of the first reports comparing quality of life (QOL) ratings of opioid addicts at admission with slow-release oral morphine, methadone, and buprenorphine maintenance program participants. In summary, significant advantages in terms of QOL and physical symptoms were found for two of the three substitution groups (methadone and buprenorphine) in comparison with patients at admission to the substitution program. Advantages for additional consumption of illicit drugs were observed in all three maintenance programs.

Before generalizing, it is important to emphasize the limitations of our results. The sample size is relatively small in comparison with other databases (Powis et al., 1996; Chatham et al., 1999; Grella et al., 2000), but it was appropriate to get statistically significant results. The data were based in a single city at one period in time. It is of interest that although the average age for opioid initiation has remained the same over the years, opioid addicts now enter treatment at a much earlier age in Austria. Our results are therefore not consistent with the findings of Chatham et al. (1999) and Craddock et al. (1997) in which the average age of admission to treatment programs was 35. Our results may be considered moderately reflective of new reliable European and Austrian trends (ÖBIG, 2002; EMCDDA, 2003). The use of standardized instruments in QOL is an important strength of the study.

When the subsets of methadone, slow-release oral morphine, and sublingual buprenorphine patients were compared with admission subjects, there were statistically significant differences in QOL scores, in which the patients of the buprenorphine and methadone group showed the more favorable values.

Our results indicate that methadone and sublingual buprenorphine are both effective, and slow-release oral morphine showed the least favorable values for QOL. Our results for the effect of methadone and sublingual buprenorphine on the patients’ QOL are in line
### Table 4
Applied questionnaires and instruments

<table>
<thead>
<tr>
<th>Measures</th>
<th>Lancashire quality of life profile</th>
<th>OWS-scale</th>
<th>Urine screening tests</th>
<th>Assessment demographic and medical data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Questionnaire</td>
<td>Questionnaire</td>
<td>Forensic method</td>
<td>Questionnaire</td>
</tr>
<tr>
<td><strong>Areas covered</strong></td>
<td>Covers the following areas:</td>
<td>Provides an objective measure of the severity of physical symptoms</td>
<td>Urine tests analyzed cocaine, benzodiazepine, amphetamine and opioids</td>
<td>Used to register specific demographic characteristics (e.g., length of heroin use)</td>
</tr>
<tr>
<td><strong>Scoring</strong></td>
<td>The interview scores on seven point Likert scales</td>
<td>Scoring from 0 to 1 (symptom present or absent) for each item. A total score for all items can be computed.</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Skills to respond</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Average time to respond (min)</strong></td>
<td>10–15</td>
<td>1–5</td>
<td>None</td>
<td>1–2</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>Designed to investigate both global well-being and well-being in individual life domains. It pays specific attention to patients’ definition of quality of life</td>
<td>Provides an objective measure of the severity of physical symptoms</td>
<td>Valid results</td>
<td>Pays specific attention to addictive problems</td>
</tr>
<tr>
<td><strong>Limitations</strong></td>
<td>The definition of QoL is a matter of an ongoing debate.</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
with findings reported in the literature. Results of similar trials indicate that methadone and sublingual buprenorphine are both effective in treating opioid dependence, both producing clinically and statistically significant reductions in illicit opioid use, improvements in self-reported physical and psychical well-being, improvements in social functioning, as well as reductions in HIV risk-behavior and criminal activity (Habrat et al., 2002; Bridge et al., 2003; Carrieri et al., 2003; Giacomuzzi et al., 2003). The changes in well-being found in this study are consistent with the benefits reported in the early studies of methadone treatment (Dole et al., 1969; Gunne and Grönladh, 1981).

Our results are, in general, in good agreement with the study by Habrat et al. (2002), who found that patients before admission to a methadone program had an extremely low QOL. After 6 months of participation, QOL increased significantly in seven of eight subscales of the SF-36. During the next 6 months, QOL unexpectedly decreased without clear reasons, but not to the prior level. Habrat et al. (2002) found no significant differences in QOL between men and women although men benefited from the methadone program more than women.

In a representative study, Ventegodt and Merrick (2003) report that the group with the lowest quality of life was found to be persons who had used heroin, morphine, methadone, and a mixture of alcohol and tranquilizers.

Our result does not confirm the findings of Mitchell et al. (2004) in all aspects. In a 4-week trial Mitchell et al. (2004) found higher SF-36 social functioning scores in the slow-release oral morphine group than in methadone patients. Mitchell et al. (2004) found no further differences in all other SF-36 scales between slow-release oral morphine and methadone.

Regarding our results, it is very tempting to link participation in a sublingual buprenorphine or methadone maintenance program to improved health and quality of life scores, but other factors may also be contributing to the improved health and quality of life scores of patients. Reintegration into the labor market and the ability to live a gainful life, becoming independent from welfare and other sources of financial support, is one of the goals in the treatment of substance dependents. In consequence, it is also a major indicator for successful treatment (Gerlach and Schneider, 1994). It is, therefore, considered to be a prerequisite for living a drug-free life (Stöver, 1995; Eckstein, 1997). Effectiveness may also depend on other treatment factors such as life activities in and out of treatment programs (Reno and Aiken, 1993). The meta-analysis by Barnet et al. (2001a) enrolled different types of patients and showed that buprenorphine was most successful, involving only few psychosocial interventions. Patients at our department received the same level of care in the different treatment groups. Office visits regarding psychosocial care were, therefore, scheduled at least every 4 weeks for all patients. For psychosocial support and treatment outcome, Gerra et al. (2004b) found in a recent study that the retention rate seems to be influenced by dose, psychosocial functioning, and not by psychiatric comorbidity in methadone maintenance patients. Gerra et al. (2004) found no correlation between retention rate and dose, or retention rate and psychosocial functioning for buprenorphine patients. As evidenced for retention, substance use history and psychosocial functioning appeared unable to influence urinalyses results in buprenorphine patients in this study. Alternatively, psychiatric comorbidity was found unrelated to urinalyses results in methadone patients. Gerra et al. (2004) concluded that psychosocial functioning and addiction severity cannot be used as valuable predictors of buprenorphine treatment outcome. In an attempt to characterize “non responsive” patients and to identify their specific treatment needs, Belding et al. (1998) compared them with a group of patients with comparable treatment tenures but whose urinalysis results indicated little or no recent illicit opiate use. Contrary to expectations, opioid use itself
was virtually the only feature that clearly distinguished the two groups. “Responders” and “non responders” did not differ significantly on measures of psychosocial problem severity in any other area, nor did they differ in their treatment service use (1998).

Although many studies document the use of the maintenance treatment to classify opioid users, the predictive validity of subgroups who respond well to psychosocial support is rarely reported (Belding et al., 1986). However, study results suggest the relation between psychosocial problems and treatment outcome may be more complex than is commonly assumed (Belding et al., 1986, 1998; Carroll, 1997; Cumberbatch et al., 2004; Gerra et al., 2004b). Further investigations and studies should be planned to identify possible characteristics of subgroups that respond well to buprenorphine or methadone treatment. It is important to continue comparing the benefits of both types of treatment, taking other factors, such as physical health, mental health, psychosocial care, and social functioning, into account.

Opioid addicts showed a more favorable physical health status after treatment with methadone, slow-release oral morphine, or sublingual buprenorphine. This result confirms the findings of Torrens et al. (1997), Kraigher et al. (2002), and Giacomuzzi et al. (2003).

In this study, all drug user maintenance treatment groups showed significantly less additional opioid consumption in comparison with clients at admission. No difference was observed in consumption of amphetamines between the groups in the current study, confirming the findings of Fischer et al. (1999a, 1999b), Eder et al. (1998), and Schottenfeld et al. (1998).

Although slow-release oral morphine is used in Austria as an alternative to methadone or buprenorphine for maintenance treatment of opioid dependence, quantitative descriptions of patient outcomes have yet to be reported (Kraigher et al., 2002; Mitchell et al., 2004). Patients on a slow-release oral morphine program in our study showed significantly more consumption of benzodiazepines than subjects treated with methadone or sublingual buprenorphine. This result does not confirm the findings of Kraigher et al. (2002) and Mitchell et al. (2004). In a study based on 18 patients, Mitchell et al. (2004) found an improved social functioning, weight loss, fewer and less troublesome side effects, greater drug liking, reduced heroin craving, an enhanced sense of feeling “normal” and similar outcomes for unsanctioned drug use, depression, and health. In a short 3-week trial using slow-release oral morphine for maintenance therapy of opioid dependence, Kraigher et al. (2002) found a significant reduction in heroin, cocaine, and benzodiazepine craving. Furthermore, Kraigher et al. (2002) found a significant reduction of additional consumption of benzodiazepines in supervised urinalysis, whereas consumption of cocaine remained unchanged.

Benzodiazepines are taken for recreational purposes by an increasing number of drug users. The true prevalence is not known, but benzodiazepines commonly form part of a polysubstance use pattern. For example, at the Liverpool Drug Dependency Unit, 44% of a random sample of 100 injecting drug users entering treatment were also using benzodiazepines (Shaw et al., 1994). The most common reason given by polydrug users for taking benzodiazepines is that they enhance and often prolong the “high” obtained from other drugs including heroin, other opioids, cocaine, and amphetamines (Ashton, 2002). Benzodiazepines are mainly taken along with the primary drug but are sometimes also used alone as an alternative or in times of shortage. Second, benzodiazepines alleviate withdrawal effects, including anxiety and insomnia, when supplies of other drugs are limited. Users of stimulants, including cocaine, amphetamines, and ecstasy, also take benzodiazepines as “downers” to overcome the effects of their “uppers” and to combat hangover effects. Finally, benzodiazepines, when taken alone in high doses and particularly when injected, can provide a “kick” themselves (Schlatter et al., 1997; Ashton, 2002).
When considering the amount of opioid and cocaine consumed, it may appear that patients who participated in the sublingual buprenorphine or methadone program were less “heavy” heroin users than those who followed the slow-release oral morphine treatment. However, for length of addiction and urinalyses, we consider that all patients had been “hard” opioid users before entering the substitution program.

Other factors, such as maintenance dosage, may also influence health and quality of life scores of patients. Adjusting an adequate dose in maintenance treatment is still a paramount problem (de Vos et al., 1996; Leavitt et al., 2000). Since methadone maintenance treatment was introduced, many studies were conducted to establish the relation between the pharmacokinetics of methadone and the therapeutic effect. Unfortunately, those studies did not lead to a general consensus with regard to well-defined dosage schedules related to clinical goals, (i.e., reduction of craving, reduction of additional use of other drugs, and reduction of HIV infections) (de Vos et al., 1996). Equivalence doses are, despite all uncertainties, the fundamentals of a practical necessity. They allow for as safe as possible dose. Practical details concerning the equivalence doses for opioids need to take the breathing depression effect and the euphoria in consideration (Seidenberg and Honegger, 1997, 1998). Direct equivalence is difficult to estimate and is not a linear relationship (Gowing et al., 2004). When comparing the efficacy of maintenance doses (e.g., 12–16 mg) buprenorphine (sublingual tablets) is approximately as effective as 50–80 mg methadone in retaining patients in treatment. It is difficult to compare doses greater than 80 mg of methadone and greater than 16 mg of buprenorphine because of their different effects (Gowling et al., 2004). According to Gowling et al. (2004) and Seidenberg and Honegger (1998), calculated dose conversions for equivalent doses in the maintenance programs of our study did not show differences. Therefore, obtained results may not be regarded as a reflection of dose effect.

Our result confirms the findings of Strain et al. (1994), Uehlinger et al. (1998), and Pani et al. (2000). These randomised, controlled studies of up to 6 month’s duration generally demonstrated comparable efficacy with buprenorphine 8–12 mg/day and methadone 30–90 mg/day in promoting retention in treatment and reducing illicit opioid use. One randomized, double-blind, dose-ranging trial was set up to compare the efficacy of buprenorphine 8 mg/day with 1 mg/day for the treatment of opioid dependence (Ling et al., 1998). Data were also collected on 4-mg and 16-mg daily doses, although these were considered as secondary outcomes. At 16 weeks, the 1-mg group had significantly poorer retention (40%) than both the 8-mg group (52.1%) and the 16-mg group (60.8%). Urine test results in this study showed less use of illicit opioids in patients assigned the 8-mg dose than the 1-mg dose. There were no significant differences between the 8-mg and 16-mg group in any endpoint. Barnet et al. (2001) suggested that a modest change in buprenorphine dose may result in substantially different outcomes. Leavitt et al. (2000) reported that the successful treatment of some patients requires doses well in excess of 100 mg/day methadone. Davids and Gastpar (2004) suggested in their recent review that buprenorphine in the dosage range 8–16 mg/day guarantees an effective maintenance therapy of opioid-addicted patients. Barnett et al. (2001a) suggested that a modest change in buprenorphine dose may cause substantially different outcomes. Additional studies will also need to determine if buprenorphine doses of more than 10–12 mg/day are more effective.

Kraigher et al. (2002) reported a mean slow-release oral morphine dose of 595 mg/day. Mitchell et al. (2004) found a mean dose of 347 mg/day after 1 month of treatment. Mitchell et al. (2004) found the mean slow-release oral morphine:methadone ratio at steady state to be 4.6:1. The slow-release oral morphine to methadone ratio in our study was 6.1:1. These ratios are partly considerably lower than in other investigations of both opioid-dependent and pain patients (5:1–20:1) (Mercadante et al., 1999; Ripamonti et al., 1998a, 1998b; Bruea
Quantitative assessments of patients’ outcomes and acceptability for slow-release oral morphine are currently lacking. Clinical implementation and evaluation of slow-release oral morphine is impeded further by the paucity of information for oral dose equivalence of methadone, buprenorphine, and morphine. The variation between different trials may be due to differences in dose levels, patient exclusion criteria, and provision of psychosocial treatment (Fischer et al., 1999). However, dose finding was not likely to have a major impact on the results of our study, because the treating physician had sufficient experience in maintenance treatment with both substances.

There is clear evidence that drug user maintenance treatment offers a range of benefits that far outweigh the costs of delivering treatment. In particular, treatment programs that focus on retaining individuals in treatment are those most likely to enhance the likelihood of achieving positive outcomes. This includes programs that adopt a client/patient-centered approach and that use a comprehensive service model, which addresses the multiple needs of individuals who are dependent on opioids. Staff training and program environments are critical areas that contribute to the therapeutic process and the achievement of positive treatment outcomes (Dazord et al., 1998).

Our results suggest that buprenorphine treatment is as effective as methadone for effects on quality of life and physical symptoms. The present data indicate that slow-release oral morphine may have some disadvantages over sublingual buprenorphine and methadone in terms of QOL, physical symptoms, and additional consumption. Future research may address the reasons for these differences.

Performing more than one follow-up can be limited by resource conditions, patients’ lifestyle, and behavior. However, controlled studies should—in QOL—identify patient subgroups who would benefit more from sublingual buprenorphine, slow-release oral morphine, or methadone maintenance treatment. There is also the need to assess critical conditions during treatment which affect treatment outcomes. Future trials should, therefore, also consider the effect of dose, treatment setting, and personal characteristics of patients.

We conclude that the use of quality of life instruments provides new insights into the assessment of the effectiveness of different maintenance treatment programs.

Acknowledgments

There was no support from external sponsors. The research was supported by internal funds only. The authors thank all the people we interviewed for their time and energy.

THE AUTHORS

Dr. Salvatore Giacomuzzi is a psychologist whose areas of interest include addiction research, evaluation for different treatment program with regard to quality of life assessment; driving capacity and maintenance treatment; psychotherapy and addiction; addictions/adolescents and children; resocialization program; resocialization and addiction; addiction and medical imaging regarding effects of psychotropic substances.
Dr. Georg Kemmler is a biostatistician. His areas of interest include statistical and psychometric issues in psychiatry, psychooncology, and quality of life research.

Markus Ertl, Ph.D., is a psychologist whose areas of interest include psychological testing; children’s behavior difficulties; addiction research; evaluation for different treatment programs with regard to quality of life assessment; driving capacity and maintenance treatment; addictions/adolescents and children; resocialization programs; resocialization and addiction.

Yvonne Riemer, MD, is a psychiatrist whose areas of interest include addiction treatment, psychiatric disorders, and addiction treatment, addiction treatment and adolescence, hep c and optimization of maintenance treatment, HIV and addiction treatment, and quality of life study.

**Glossary**

QoL (Quality of life) The definition and measurement of QoL is a matter of a considerable debate. QoL is generally conceptualized as a multidimensional construct encompassing several domains. This follows from the widely accepted definition of health put forward by the World Health Organization as the state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. The Group describes QoL as the individual’s perception of their position in life, in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. QoL can include both objective and subjective perspectives in each domain. The objective assessment of QoL focuses on what the individual can do and is important in defining the degree of health. The subjective assessment of QoL includes the meaning to the individual; essentially it involves the translation or appraisal of the more objective measurement of health status into the experience of QoL.

Maintenance treatment pharmacotherapy

*Methadone* Methadone is a long-acting oral opioid or narcotic medication which suppresses symptoms of opioid withdrawal and reduces cravings for opioids without causing euphoric or sedative effects (For further pharmacological information. Methadone
maintenance treatment is designed to reduce illegal and harmful opioid use (e.g., heroin, codeine, dilaudid, oxycodone) along with the many problems (e.g., crime, death, disease) associated with this addiction.

**Buprenorphine** Buprenorphine is a partial mu agonist. Agonists are chemicals that bind to and stimulate opiate receptors. Antagonists block the effects of opiates by binding to receptors without stimulating them. By stimulating mu opiate receptors in the brain, mu agonists produce the effects associated with morphine: analgesia, euphoria, sedation, and respiratory depression. Because buprenorphine is a partial mu agonist, it also readily binds to mu opiate receptors. However, buprenorphine activates these receptors to a lesser degree than full mu receptor agonists such as morphine and heroin. Buprenorphine’s unique effects and pharmacology make it an attractive and clinically helpful treatment option. When compared with other opiates, it also causes a significantly lower degree of sedation and respiratory depression, the slowing down of breathing that makes heroin overdoses so dangerous. Even high doses of buprenorphine does not produce dangerous respiratory effects.

**Slow-release oral morphine (SROM)** Slow-release oral morphine has been proposed as an alternative maintenance pharmacotherapy to methadone for treatment of opioid dependence. Morphine is a muopioid receptor agonist with a short duration of action that has traditionally limited its therapeutic utility in the treatment of opioid dependence. Slow-release oral morphine (SROM) formulations extend the dosing interval for morphine, thereby enhancing its potential as an alternative maintenance pharmacotherapy to methadone or buprenorphine.

**References**


CIDAD Group of Experts in Demand Reduction August 2001, 8–10, Jamaica.


