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HOSPITAL UTILIZATION OUTCOMES FOLLOWING ASSIGNMENT TO OUTPATIENT COMMITMENT

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Abstract

Background: Outpatient civil commitment (OCC) requires people with severe mental illness (SMI) to receive needed-treatment addressing imminent-threats to health and safety. When available, such treatment is required to be provided in the community as a less restrictive alternative (LRA) to psychiatric-hospitalization. Variance in hospital-utilization outcomes following OCC-assignment has been interpreted as OCC-failure. This review seeks to specify factors accounting for this outcome-variation and to determine whether OCC is used effectively.

Method: Twenty-five studies, cited in seven meta-analyses and subsequently published investigations, assessing post-OCC-assignment hospital utilization outcomes were reviewed. Studies were grouped by structural pre-determinants of hospital-utilization and OCC-implementation--i.e. deinstitutionalization (bed-availability), availability of a less restrictive alternative to hospitalization, and illness severity. Design quality at study completion was ranked on causal-certainty.

Results: In OCC-follow-up-studies, deinstitutionalization associated hospital-bed-cuts, when not taken into account, ensured lower hospital-bed-day utilization. OCC-assignment coupled with aggressive case-management was associated with reduced-hospitalization. With limited community-service, hospitalizations increased as the default option for providing needed-treatment. Follow-up studies showed less hospitalization while on OCC-assignment and more outside of it. Studies using fixed-follow-up periods usually found increased-utilization as patients spent less time under OCC-supervision than outside it. Comparison-group-studies reporting no between-group differences bring more severely ill OCC-patients to equivalent use as less disturbed patients, a success.

Mean evidence-rank for causal-certainty 2.96, range 2–4, of 5 with no study ranked 1, the highest rank.

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Conclusions: Diverse mental health systems yield diverse OCC hospital-utilization outcomes, each fulfilling the law’s legal mandate to provide needed-treatment protecting health and safety.

Keywords

Community treatment order; Outpatient civil commitment; Law and Psychiatry; Involuntary treatment

INTRODUCTION

Outpatient civil commitment (OCC), a community treatment order (CTO) in European and Commonwealth Nations, is a law requiring patients with severe mental illness (SMI) to receive needed-treatment when they are refusing treatment participation addressing imminent threats to health and safety associated with their illness.¹ When available such treatment is required to be provided as a less restrictive alternative (LRA) to psychiatric-hospitalization.² Hospitalization, however, remains the default for such treatment in the absence of community-based services.² Variance in hospital utilization outcomes following assignment to OCC have been interpreted in seven OCC meta-analyses in the U.S., Europe, and Commonwealth Nations as an intervention failure.^{3–9} This review seeks to specify factors potentially accounting for this outcome variance and to determine whether OCC is being used effectively. In doing so it takes into account structural pre-determinants of hospital utilization that influence the implementation of OCC requirements for providing needed-treatment—i.e. deinstitutionalization (bed-availability), availability of a LRA to hospitalization, and illness severity. Given that OCC-studies are conducted within systems of care that differ on these characteristics, it seems reasonable that the OCC-approach to providing needed-treatment to protect health and safety will differ across jurisdictions.

Deinstitutionalization and Hospital Utilization

There is an international deinstitutionalization-dynamic largely driven by the economics of mental health care.^{10–12} Psychiatric hospitals improve their services, reduce their beds, and become too expensive to sustain.^{10–12} Attempting to reduce this economic burden, jurisdictions develop an extensive array of community-services usually based on an assertive community treatment (ACT) model that, in comparison to the psychiatric hospital, looks inexpensive and is reassuring to the public that patients will receive adequate oversight in the community.^{11, 12} Once the psychiatric hospital is closed, however, the costs of community-care have no favorable comparison-costs. Managed care, focused on the economics of health-delivery encourages mental health systems to reorganize around general hospital integrated-care.¹⁰ The mandated objectives of OCC, protecting safety of self and others from the behavioral consequences of SMI, are displaced by the goal of “prevention of hospitalization”, stigmatizing hospital use. This empowers factions opposing hospitalization based on human rights concerns and those groups committed to cost-savings in mental health services to cut beds¹³. Reduced availability of general hospital beds creates pressure for earlier discharge to accommodate new acute patients.¹⁴ In the absence of strong ACT or equivalent case-management, hastened discharge leads to a high probability of readmission for symptoms associated with the original hospital stay.¹⁵ The “revolving-door” effect is exacerbated in managed care systems where hospitals are paid a fixed-fee per admission--

profiting when admissions are short and re-hospitalization is billable as a new encounter. OCC orders, in the absence of adequate community-care, carry out their mandate to enable the provision of needed-treatment: crisis returns to hospital, the default requirement in the absence of adequate-community-treatment.¹⁶ Critics and researchers conflating outcome (hospital utilization post OCC-assignment) and intervention (provision of needed-treatment via hospitalization as a default-requirement in the absence of an LRA), misrepresent this intervention as a negative outcome, OCC's failure to "prevent hospitalization".

A "Less Restrictive Alternative to Hospitalization" and Hospital Utilization

OCC is generally described as a *less restrictive alternative (LRA) to psychiatric hospitalization* for those meeting the commitment criteria of the jurisdiction. The concept derives from the *Lake vs. Cameron 364 F.2d 657 1966* finding that a person "cannot be kept in an institution if there's some less restrictive way to keep her safe."² Most importantly, the LRA to hospitalization implies that there is an available and effective alternative. Without such an alternative, the hospital remains the treatment of choice.

Review articles³⁻⁹ focus on "preventing hospitalization" and "revolving door patients." Recently revised statutes do frequently discuss providing needed-treatment to "prevent deterioration". However, a computer driven content search of the 46 U.S. jurisdictions with OCC-statutes, 8 Australian, the U.K., the Norwegian, the Israeli, the Canadian, and the New Zealand statutes finds no mention of "preventing hospitalization".¹ Including "preventing hospitalization" in the statute would be legislating the denial of peoples' access to needed-treatment in the absence of available or effective community-based services. Statutes may limit the use of OCC to patients with a history of repeated admissions using such as validation of a pattern of deterioration following stabilization and treatment-secession. They do not mention "revolving door patients"¹. The U.K.'s post-legislative scrutiny of its Mental Health Act 2007, notes: "During the passage of the 2007 Act, Parliament considered and rejected the proposal that OCC should be limited to those with a history of non-compliance"¹⁷. Herein I consider those studies where investigators have, despite its absence as a legislated or adjudicated objective of OCC, focused on preventing hospitalization as an outcome.

Patient Severity and Hospitalization

Independent-assessments of 445 patients' admission evaluations in nine general hospitals in California (N=445) found psychotic disorder and dangerousness (in conformity with the admission standard) was the primary admission determinant.¹⁸ OCC-patients have greater indications of active threats to health and safety than other hospitalized patients.¹⁶ They, by definition, are refusing treatment and, without a requirement to participate in treatment, are likely to avoid participation. OCC mandates use of needed treatment while in effect. There is no reason other than a potential threat of OCC re-assignment that its effect should continue beyond the time it is in place. OCC does not change the nature of the disorder that is a treatment function.

This review considers deinstitutionalization (bed-availability), availability of a LRA to hospitalization, and illness severity as structural pre-determinants of hospital utilization that shape the implementation of OCC requirements for providing needed-treatment.

2. METHOD

Selection of studies

All quantitative-studies accessed in seven previous OCC-reviews published through 2018 and additional publications through August 2020 were included in this review's evaluation-pool.³⁻⁹ The list of OCC studies was developed by working backwards from the reference lists of the most recent review (Barnett, Matthews, Lloyd-Evans, Mackay, Pilling, Johnson, 2018) through the references of all six other reviews. In addition, since Barnett et al (2018) searched through the fourth week of December 2017, this review searched for additional studies from January 1, 2016 through August 2020. The procedure for the search in each review article and followed herein is that described in Barnett et al (2018)¹.

Studies included a majority (>50%) of patients with SMI. Forensic investigations were excluded. Studies limiting the groups of patients assigned to OCC in a way that influenced potential for re-hospitalization or failing to report all post-OCC-hospitalizations were also excluded. Notably two U.S. studies were excluded,^{19,20} one of which did not enforce OCC-returns to hospital¹⁷, and both of which excluded dangerous patients when, in most jurisdictions, dangerousness and psychosis are the two most important reasons for re-hospitalization.^{19,20} A UK study was also excluded as it failed to count brief-hospitalizations as such.²¹ In these three studies, the post-hospitalization criterion lacked validity as a measure of post-OCC-assignment-hospital-utilization.

Assessing OCC-research

Previous OCC-reviews have aggregated all studies and relied solely on main-effect study outcomes in documenting variance in post-OCC-assignment hospital-utilization outcomes.

In the tradition of investigative epidemiology, this review contextualizes studies according to the structural pre-determinants of post-OCC-assignment hospital-utilization. By reporting study results within each pre-determinant category, it controls for potential interaction effects ignored by previous reviews. Results are two-fold in that they first involve a finding and specification of the structural pre-determinant applicable to a study's context and then the study hospital-utilization outcomes.

In addition, this review evaluated studies based on three experimental design criteria:

¹Barnett et al (2018) searched three electronic databases (PsychINFO, for articles published between Jan 1, 1806, and the fourth week of December, 2017; Embase, between Jan 1, 1974, and the first week of January, 2018; and MEDLINE, between Jan 1, 1946, and the fourth week of January, 2018) for publications in English, using the search terms "community treatment order" or "CTO" or "outpatient commitment" or "'compulsory' or 'mandatory' outpatient commitment" or "civil commitment" AND "SMI" or "psychiatric" or "manic" or "schizophrenia" or "bipolar". They then applied a backwards reference search to the studies identified by manually searching reference lists of eligible studies. They also searched for articles that cited eligible studies using Scopus, and assessed those for eligibility. They searched review articles identified through the search to identify additional studies. Bursten, 1986 and Kallapiran et al, 2010 are not considered herein. Though reported on in Barnett et al's review, they were outside the scope of review criteria specified for that review and all previous reviews since they included forensic patients.

1. *Independence of the intervention and outcomes measurement:*

The extent to which the interpretation of post-release-hospitalization-outcomes were compromised by being conflated with mandated-provision of needed-treatment and/or other structural pre-determinants of post-hospital-utilization statistics.

2. *Level of causal certainty attributable to a study's design on completion:*

The study's rank in the evidentiary-hierarchy of causal-certainty based on how it was implemented. Studies' ranking was determined by the combined use of two scoring systems, the Berkeley Evidence Rank (BER) system²² and the Newcastle-Ottawa Score (NOS)²³. BER and NOS inter-system-agreement on evidence rankings for 21 OCC-outcome-studies with both available scores included in the seven reviews and the more recent study additions was $r_{\text{Pearson}} = |.78|$ and $r_{\text{Spearman rank order}} = |.79|$.²²

3. *Applicability of the "null hypothesis":*

A "no impact expectation" was made for all studies. When pre-existing disabilities related to making an OCC-assignment remained uncontrolled at a study's end, the "null hypothesis" is misapplied. The OCC-group, selected on the basis of the severity of their symptomology and their refusal of treatment, is justifiably expected to do worse, so a positive finding might be one where outcomes improve to a level where they are no different from the less-disturbed comparison-group. Comparison-group-studies, without adjustment of illness condition, cannot conclude: "no impact" or more accurately "failed to find an effect".²⁴

RESULTS

Evidence-Ranking

Average evidence-rankings for all 25 post-OCC-assignment studies with hospital-utilization-outcomes are included in Table I. Post-OCC-assignment hospital-utilization-studies had an Evidence-Rank $M_{\text{Sample-Weighted}} = 2.96$ on a scale of 5 where the top rank would be a score of 1. Evidence-ranks in both the BER and NOS systems for each study when applicable and available are included in the study summary Table II.

Hospital Utilization Following OCC-assignment (see Table II).

Twenty-five studies of post-OCC-assignment hospital-utilization outcomes are grouped herein by five structural pre-determinants. Each section begins with specification of the pre-determinant's influence and is followed with a report of the studies' utilization results within that context. Studies are referenced alpha-numerically herein by their group letter, and their order of presentation in Table II, e.g. the first study in study grouping A, Hospitalization and Deinstitutionalization, would be A.1.

A. Hospitalizations and Deinstitutionalization (Table II, A.1).—The structural feature determining hospital-admission numbers in the last 60 years is hospital-bed-

availability. Reduced bed-availability in the short-term is associated with increased admissions of shorter duration,²⁵ in the longer-term there are not enough beds, admission numbers fall and patients are left to homelessness or housed in forensic-facilities and nursing homes²⁶. A.1 [Evidence Rank $M_{\text{Sample-Weighted}} = 3.00$], examined hospital bed-day usage pre/post the introduction of OCC to Scotland.²⁷ It reported that between 2007–2012 OCC-patients evidenced a 40% drop in bed-days.²⁷ OCC use began in Scotland in 2005. From 1997–2007 psychiatric-beds were reduced by one-third; from 2007–2012 bed-numbers fell another 26%.²⁸

B. OCC-tenure (Table II, B.1–2).—These studies reflect the effects on hospital-days and admissions while under OCC-supervision. Since a majority of OCCs terminate in a brief period of time²⁹, studies comparing OCC vs. non-OCC groups for a fixed-follow-up-period of a year or two after hospital release are comparing the experiences of two groups who have spent most of their time outside of OCC-supervision. Doing so provides an inaccurate assessment of the role of OCC. These studies conflate time during the follow-up period on OCC with time outside of OCC-jurisdiction. Two studies [Evidence Rank $M_{\text{Sample-Weighted}} = 2.50$], accurately, consider admissions, hospital-days, and outpatient-service-utilization during OCC. Both B.1³⁰ and B.2³¹ found fewer hospital-days and admissions as well as more service-utilization characterized the OCC-group during their OCC-tenure.

C. Studies from OCC-jurisdictions where patients were assigned to ACT-teams, and/or where community-services were increased, prioritized (often targeted) for OCC-patients, and where these services received increased financial support (Table II, C.1–13).—Thirteen studies address this issue [Evidence Rank $M_{\text{Sample-Weighted}} = 3.00$]. The ACT-team, employing aggressive case management, is the most effective way to reduce or prevent hospitalization.³² The weighted relative benefit index for experimental vs control groups in ACT randomized-studies is 97% for “Not admitted to hospital.” When the system of care has an ACT-team or an equivalent form of aggressive-case-management, the focus of the team is keeping the patient out of the hospital. One large study C.1³³ and three smaller ones C.2–C.4,^{34–36} respectively, show that OCC coupled with ACT or an “assertive outreach team” reduced post-OCC-admissions and total-bed-days. This result is most vividly illustrated in C.1,³³ where the state incorporated ACT-teams into their OCC-strategy and the combination showed an incremental effect of OCC-plus-ACT over ACT alone.

C.5, C.6 show the effect of combining OCC with increased services.^{37,38} C.4 and C.7 show reduced-admission-outcomes associated with a jurisdiction’s commitment to fund increased services for OCC-patients.^{36,39} C.10 found that after the initiation of a case-management-program there were reductions in admission-numbers and in admission duration during OCC when compared to the prior 12 months.⁴⁰

A jurisdiction’s commitment to provide aggressive community services in conjunction with OCC was found in C.8 to significantly reduce admission-numbers for the OCC-group pre/post the implementation of the law. It brought the service level to that characterizing the voluntary-comparison-population.⁴¹ Similarly, C.9^{42,43} studied involving police enforcement. They found that within the first 6 months of follow-up the OCC-group

showed a decrease in readmissions, bringing them to the level of the control-samples. In the last quarter of their 24-month follow-up, however, the controls had significantly fewer admissions than the more severely ill OCC-patients did--perhaps a reflection of the absence of OCC-oversight. All these study findings support the association of community-service-increase with reductions in re-admissions and total-inpatient-days.

Three additional studies provide mixed-results, mentioning a need to improve outpatient-services but providing no direct evidence of enhanced outpatient-services. C.11⁴⁴ and C.12⁴⁵ compared OCC-group experience pre/post assignment. Both reported a significant reduction in admissions-per-year and non-significant trends in reduced hospital-days-per-year. C.13⁴⁶ found reductions in admissions and bed-days pre vs during and pre vs post OCC.

D. Studies from Jurisdictions Reporting that Community-Service Contacts Had Been Reduced Or Were Limited (Table II, D.1–3).—Three studies address this

issue [Evidence-Rank $M_{\text{Sample-Weighted}} = 2.33$]. No OCC-statute^{1, 47}; includes the words “prevent hospitalization” or “stop the revolving door.” To do so would be eliminating access to needed-treatment especially where community service is limited. D.1¹⁶ reported a reduction in the frequency of community-service contacts-per-community-care-episode accompanied by increased re-hospitalization and increased post-OCC-hospital-days, despite showing briefer hospital-episodes, i.e. OCC-associated early-releases. This scenario is validated in D.2⁴⁸ where a majority in the pre and post period had OCC-associated-returns to psychiatric-emergency-commitments. The explanation, derived from survey-reports, focused on the use of OCC with a lack of community-treatment resources.⁴⁸

D.3⁴⁹ reports their research protocol guaranteed that all subjects received a minimum level of case-management, but the intensity of case-management and the provision of other services was driven by the locally developed treatment plan and was not subject to research control. Re-admission to hospital was significantly associated with the amount of service received indicating that the service component of the study was crisis-oriented and perhaps not equal to the psychosocial outreach character of an ACT program.

E. Conflating severity and chronicity with hospital-utilization outside of OCC influence (Table II E.1–6).—Six studies address this issue [Evidence Rank

$M_{\text{Sample-Weighted}} = 3.25$]. OCC-patients are selected because they usually have histories of more and longer hospital-admissions than other hospitalized-patients and because of the severity of risk associated with their presenting conditions.^{16,50,51} When comparing more severely ill OCC-patients to non-OCC-patients, the former, given the severity of their illness and greater need of treatment, always begins and ends with more admissions and total-hospital-days. E.2⁴⁴ demonstrates this by showing that the OCC-patients had a greater number of admissions per year and more inpatient-days-per-year throughout their study than non-OCC-patients did. Similarly, E.6⁵², though controlling for past experience, found that the OCC-cohort had a greater rate of re-hospitalization than two comparison groups.

E.3⁵³ illustrates another aspect of the severity of illness. Usually long-acting injectable (LAI) anti-psychotics are prescribed to non-compliant patients. This study found that

patients receiving LAI antipsychotics were in fact more likely to have longer periods on OCC, a fact partially confirming their lack of treatment-compliance.

The primary criteria for OCC-placement includes threats to health and safety manifested in dangerous aggressive behavior, denial of treatment need and lack of insight as to one's mental illness. E.4⁵⁴ built their study by matching cases on socio-demographics and previous hospital usage. Retrospectively, they found no difference in use of hospital. Yet the OCC-group were significantly more aggressive and included more treatment deniers, indicating that they were at greater risk for hospital-use. While "no difference" is a failure to find a difference, when there is no difference between a more and less disturbed population that does appear to be a positive outcome. Similarly, in E.5⁵⁵, a pre/post study, primarily people with schizophrenia diagnoses experienced the reduced use benefit.

DISCUSSION

This review investigated how and to what extent OCC has utility for accomplishing its statutory objectives associated with hospital utilization post-OCC-assignment as considered in studies across nations, jurisdictions, and over the last 30 years. Studies indicate that OCC generally enables reaching its objectives with respect to such outcomes. As a LRA to hospitalization when community-services are available, it helps to limit hospitalization, in the absence of adequate community-care it brings patients back to needed-treatment in hospital preventing their engagement in behavior likely to disrupt recovery-efforts going forward.

While OCC-assignment is associated with shortened duration of an OCC-associated-hospitalization, its effect on "total inpatient days" and "readmissions" post-OCC is not a simple one. Studies consistently indicate that, within a fixed period, if the OCC is coupled with ACT or some form of aggressive-case-management it will be associated with enhancing the outpatient-program objective of reducing re-hospitalization numbers. In these jurisdictions, OCC is associated with enhancing ACT programing. ACT aggressively pursues patients; OCC compels participation with the ACT team. In jurisdictions where outpatient-services are more limited, services appear to become crisis-oriented and the potential of OCC is in facilitating rapid return to hospital for needed-treatment. In this situation, OCC is associated with increased "total-hospital-days" and readmissions when contrasted with a comparison-group. In pre/post-designed studies, OCC patients generally show a decrease in hospital-days and admissions between the pre/post periods, reflecting a combination of the effects of deinstitutionalization, regression to the mean, and facilitated early-release and diversion attributable to additional OCC-associated-inpatient-episodes following the initial OCC-episode. In Victoria Australia, almost half the OCC-patients had more than one OCC-assignment. In pre/during/post studies, the OCC-patients show the reductions in hospital-utilization during when compared to the pre-period, but generally show an increase in the post-period.

In comparison group studies, despite, matching on demographics and hospitalization history, independent clinical assessments indicate OCC-patients are more symptomatic than non-OCC-patients--especially with regard to symptoms that are likely to threaten health and

safety.^{16,56} They are also more likely, because of their illness, to reside in neighborhoods that compound such threats.⁵⁷ Thus, bringing OCC-patients to a “no difference” with a non-OCC-comparison-group is likely a positive result, though technically “a failure to find an effect”. It should not be considered a negative outcome as it has been reported in the literature since the expected effect is that OCC-patients will under-perform.

The studies in New York³³ and Victoria¹⁶ best illustrate OCC-effects in large statewide samples. They illustrate the impact of community service on hospital-utilization outcomes post-OCC-assignment. New York’s combination of ACT and OCC was associated with reduced total-hospital-days and admissions. The effect was greatest in the OCC/ACT group, second in the ACT and less in the non-OCC/non-ACT groups.³³ Victoria went in the opposite direction of reduced outpatient-service contacts with the consequence of potentially fostering a crisis-oriented preventive system of care that has led to increases in hospitalization and total admissions enhanced by continued reductions in the availability of inpatient-beds.⁵⁸

The OCC reviews³⁻⁹ may be well intentioned in their focus on the potential disruptions to the patient, family and community of repeat hospitalizations. Maughan et al⁵ recognize, as a post script, the fact that readmission can be the intervention as opposed to the outcome. Rugkasa et al⁴, however, are explicitly research-expedient in their advocacy for post-OCC-assignment-rehospitalization as the primary measure of OCC-outcome, since “Readmission is the measure most consistently used”^{4p. 1869} and because “readmission is a measure for which data are obtainable”.^{4 p 1869} Adopting this measure, is not only inconsistent with the law^{1,17}, but framing the problem as one of the “revolving-door” patient^{4,7} falsely stigmatizes the individual for the system’s failure to provide adequate community-based treatment services. Early release without such service has been found to account for as much as a 50% rate of return to the psychiatric emergency room for the same reason justifying an original admission.¹⁵ By focusing on “revolving door”^{4,7} and preventing hospitalization criteria³⁻⁹, not mentioned in the law,¹ and associating OCC with a threat to civil liberties⁴ as opposed to the threat to health and safety and the delivery of treatment, preferably in the community, though in the hospital if necessary, the reviews have shifted failure of service delivery responsibility to appear to be a failure of OCC law. They have obscured OCC’s potential benefits—i.e. getting a patient through an episode of illness that poses significant risks to health and safety of themselves and others and potentially constitutes an irreversible threat to patient recovery, a fact that may cost lives.^{33,57,59} As such their conclusions of “no discernible effect” should be deemed inaccurate.

Future OCC-research needs to explicate the service and resource context of the jurisdiction in which it occurs and where the system of care is with respect to its international deinstitutionalization dynamic.

LIMITATIONS

The studies herein reviewed are varied in design and quality and discussed as though each added an equivalent piece of information. All studies provide associations. None of them insures causal-certainty. Some studies may unfortunately have been overlooked. Most

of the epidemiological studies use administrative data and several rely on medical record information that may be less reliable than information gathered in designed research.

CONCLUSION

Previous OCC-research reviews find variance in OCC-hospital-utilization outcomes post-OCC-assignment. Contextualizing study results, this investigation finds consistency. Studies confirm a successful LRA-effect associated with using OCC across five countries, three of them commonwealth nations (3–4 jurisdictions in each) and nine jurisdictions in the United States.

GLOSSARY OF ABBREVIATIONS

ACT	Assertive community treatment, a form of intensive case management based on psychosocial intervention focused on maintaining severely mentally ill patients in the community.
BER	Berkeley Evidence Rating—Ranks comparison group studies according to an evidence hierarchy based on the quality of the study's design implementation upon completion.
LRA	Less Restrictive Alternative to psychiatric hospitalization
MPR	medication-possession-ratio
NOS	Newcastle-Ottawa Score. Ranks studies according to an evidence hierarchy based on the quality of the study's design.
OCC	Outpatient civil commitment; Also referred to as: CTO-Community Treatment Order;AOT-Assisted Outpatient treatment
RCT	Randomized Controlled Trial

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Table I:

Evidence Ranking of Studies With Hospital & Service Outcome Measures Following OCC-assignment

Outcome	Number of Studies Addressing the Designated Outcome	Total Sample N	Combined BER and NOS Ranks*				
			Weighted Mean	Mean	Median	Mode	Range
A. Hospitalization and deinstitutionalization	1	1,558	3.00	3.00	3.00	3.00	3
B. Community service utilization during OCC period	2	17826	2.50	2.50	2.50	-	2-3
C. Admissions & Hospital Days When Accompanied by ACT & Enhanced Community Services	13	8,652	3.00	3.00	3.00	2&4	3-4
D. Admissions & Hospital Days When Accompanied by Reduced Community Service Access	3	27,899	2.33	2.33	2.00	2.00	2-3
E. Admissions and Hospital Days Conflated With Severity and Chronicity	6	28,702	3.25	3.25	3.75	4.00	2-4
Validity Group II Study Outcomes	$N_{\text{Outcomes}} = 25$		$M_{\text{of Outcome Groups}} = 2.96$	2.96			

* In order to enable a causal ranking for a given outcome area in Table 1, the NOS ranks were reversed to match BER rank ordering (NOS=9 was coded 1, 8 coded 2...5 coded 5). When only one rank in either the NOS or BER system was available that rank was accepted. When both systems ranked a study, the average rank was used.

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Table II

Hospital Admission, Hospital Day Accumulations, and Service Utilization Outcomes Conflated with Resource Availability, Severity, and Chronicity

A. Hospitalizations and Deinstitutionalization: Reports conflating utilization with hospital bed reductions						
Study	Jurisdiction	Sample Size (N) by Group Membership	Outcome Criteria	Design & Analysis features	Summary of finding(s)	“No impact” Expectation ^a
A.1. Taylor et al 2015 <i>BIPsych Bulletin</i> 39(5): 1–3. ²⁷	Scotland	Community treatment order(CTO) N=1558	Number of bed-days Pre vs post CTO.	Own Control Pre-Post Design	Reduction of bed-days by 40%.	Bed days. < However is undeterminable because between 1997/98 and 2006/7 the total number of psychiatric inpatient beds was reduced by a third (Audit Scotland report, 2009). From 2007–2012, it fell another 26%. During the same period, duration of stay decreased (see ISD hospital bed numbers currently published for 2004/05 to 2013/14).
B. Reports on CTO tenure: community-based service utilization, re-hospitalization, and duration of CTO						
Study	Jurisdiction	Sample Size (N) by Group Membership	Outcome Criteria	Design & Analysis features	Summary of finding(s)	“No impact” Expectation ^a
B.1. Harris et al 2018, <i>Australia NewZealand J. Psychiatry</i> 1–8. ³⁰	New South Wales, Australia	CTO N=5548 vs. Non-CTO N=11,096	Community service utilization; Risk of Readmission Admission s; Days to first Readmission; Community treatment days per month; Days in Hospital.	Case Control Design; Propensity Score Adjustment	Lower Risk of re-admission, more community days to fist readmission; fewer readmissions; More community treatment days.	Not determinable for: Re-admission, days to first admission, and number of admissions because shorter time, may indicate lack of available community care and delivery of needed treatment via readmission, time may indicate adequate use of community care. < community-based service/care.
B.2. Segal and Burgess 2006a, <i>Int J Law Psychiatry</i> 29(6):525–534. Reprinted in <i>Social Work & Health Care</i> 2006,43(2/3), 37–51. ³¹	Victoria, Australia	CTO N=591 vs. Non-CTO N=591	Re-hospitalization; Inpatient days; Community service use.	Adjusted Comparison Group Study; Propensity Score Adjustment (Regression), Confounding Factor Adjustment (via Matching and Regression); 10-year risk period	>6 month-CTOs associated with reduced number of admissions, inpatient days, and increased services.	Not determinable for hospital days & readmissions because each is dependent on the availability and adequacy of community treatment and the use of hospital to provide needed treatment in the absence of effective community treatment. < community-based service/care.
C. OCC Jurisdictions Where Patients Were Assigned to Assertive Community Treatment (ACT) Teams, and/or Where Community Services Were Receiving Increased OCC-Patients).						
Study	Jurisdiction	Sample Size (N) by Group Membership	Outcome Criteria	Design & Analysis features	Summary of finding(s)	“No impact” Expectation ^a

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C.1. Swartz et al. 2010 <i>Psychiatric Services</i> , 61(10), 976–981. ³³	New York	OCC N = 3,576 Non-OCC=2,025	Admissions; admission length; community service use; Medication Possession Ratio (MPR)	Adjusted Comparison Group Design	OCC associated with: Reduced admissions length, Reduced number of admissions, Increased community service use and increased MPR	< receiving MPR, community service use; > days hospitalized/admissions
C.2. Hunt et al 2007, <i>Can J Psychiatry</i> 52(10):647–655. ³⁴	Toronto, Canada	CTO N=224 vs. Non-CTO N=92	Admissions; Admission length; Community service use	Simple Comparison Group Design	CTOs associated with: Reduced admission length, larger reduction in number of admissions, and reduced community service use.	> Duration of admission > Number of admissions < community service use
C.3. Nakhost et al. 2012 <i>Can J Psychiatry</i> 57(6):359–365. ³⁵	Quebec, Canada	CTO N=72	Admissions; Admission length	Own Control Design; Four period comparison.	Reduced number of admissions in CTO index period	> Increased number of admissions
C.4. O'Brien & Farrell. 2005 <i>Can J Psychiatry</i> 50(1):27–30. ³⁶	Ontario, Canada	CTO N=25	Admissions; Duration of Admissions and Community service	Own Control Design; Pre-Post	CTO associated with reduced admissions, duration of admissions, and increased community service use	> admissions and duration of hospitalizations;< community service
C.5. Rawala M, Gupta S 2014 <i>Psychiatr Bulletin</i> , 38, 13–18. ³⁷	London, England	CTO N=37	Admission rates and bed occupancy	Own Control Design; Pre-Post	Reduction in admission rate	admission rate
C.6. Rohland, et al 2000 <i>Admin & Policy in Mental Health</i> 27(6): 383–394. ³⁸	Iowa, USA	OCC N=81	Outpatient visits; Admissions; Total hospital days	Own Control Design; Pre-Post	Increased outpatient service use associated with decreased in hospital admissions, total hospital days, length of stay.	admission rate and bed occupancy; < outpatient service
C.7. Fernandez & Nygard 1990 <i>Psychiatr Serv.</i> 41(9): 1001–1004. ³⁹	North Carolina	OCC N=1983	Admissions; Inpatient days	Own Control Design; Pre-Post	O	number of admissions
C.8. Power, 1992 <i>unpublished, reported extensively in Churchill et. al.</i> ⁴¹	Melbourne, Australia	Two studies: 1 Pre/Post CTO N=125 2 CTO N=104 vs. Non-CTO N=104	Admissions, and duration of stay	1 Own Control Design; Pre-Post 2 Adjusted Comparison Group Design	1 Reduced number of admissions and inpatient days. 2 No different from control on number of admissions.	1 > admissions and duration 2 > admissions
C.9. Geller et al, 1997 <i>New Directions for Mental Health Services</i> (75): 81–95. & 1998 <i>Administration & Policy in Mental Health</i> 25(3):271–85. ^{42,43}	Massachusetts, USA	OCC N=19 (20 at 2-year follow-up) Non-OCC N=53 (N=57 at 2 year followup) Non-OCC N=19 best match (20 at 2-year followup)	Number of admissions and length of stay	Adjusted Comparison Group Design	Early on, within first 6 months of follow-up OCC group showed decrease in readmissions, bringing them to the level of the control samples. In the last quarter of the 24-month follow-up, the controls had significantly fewer admissions.	> admissions

C.10 Ozgul and Brunero 1997 <i>Australasian Mental Health Rev</i> 20:70–83. (see also 2E.5 medication review) ⁴⁰	Australia; SW of Sydney	CTO N=46	Number of Readmissions. Duration of stay	Own-Control Pre/During/ Post Pre-Post Design	Reduced admissions during first CTO; and reduced hospital stays. Post CTO, those who were admitted during 1 st CTO went back to same admission and duration frequency as the pre-period,	> Number of admissions and bed
C.11. Zanni & Stavits 2007, <i>Am J Bioeth</i> 7(11):31–41. ⁴⁴	Washington DC, USA	OCC N=116	Number of admissions; Hospital Days	Own Control Design; Pre-Post	Reduced admissions per year pre vs post (p< .002); Non-significant (p=.061) positive trend in reduction in pre/post hospital days.	Indication that outpatient services had improved though not sufficiently to meet a court order.
C.12. Zanni & de Veau. 1986, <i>Hosp & Comm Psych</i> 37:941–942. ⁴⁵	Washington DC, USA	OCC N=42	Number of admissions; Hospital Days	Own Control Design; Pre-Post	Reduced admissions per year pre vs post (p<.001); Non-significant (p=.28) positive trend in reduction in pre/post hospital days	Initiation of OCC. Indication of potentially enhanced outpatient services though no direct evidence of such.
C.13 Awara, et al., 2013 <i>J of Mental Health</i> . 22:2, 191–197. ⁴⁶	South Essex	OCC N=34	Number of admissions; Number of days in Hospital	Own Control Design; Pre-During-Post	Reduced admissions and days in hospital comparing pre year to during CTO and to post-CTO	> Number of admissions and bed days. Indication of attention to needed services. CTO was renewed after 6 months in 24 cases (71%) and expired or lifted in 10 patients (29%). Follow-up was fixed at a year for all. Therefore, post mean was dependent on during mean which reflected less admissions and hospital days.

D. Studies from Jurisdictions Where There Was a Report that Community Service Contacts Had Been Reduced or Where There Was a Report of Limited Community

Study	Jurisdiction	Sample Size (N) by Group Membership	Outcome Criteria	Design & Analysis features	Summary of finding(s)	“No impact” Expectation ^a
D.1. Segal Hays Rimes 2017a, <i>Psychiatric Services</i> 68(12):1247–1254. ¹⁶	Victoria, Australia.	CTO N=11,42 4 vs. Non-CTO N=16,161	Total inpatient days Post-CTO hospitalizations. Service contacts	Case Control Design; Propensity Score Adjustment (Regression); Matching and Regression	Total inpatient-days post-CTO and number of admissions greater than comparison patients. Service contacts within episodes of community care decreased.	Undeterminable since given cuts in community-based services, there is an expected increase in the hospital’s role in providing needed treatment for more disturbed patients.
D.2. Christy et al 2009 <i>Int J Forensic Ment Health</i> 8:122–130. ⁴⁸	Florida, USA	OCC N=50	Number. of admissions	Own-Control Design; Pre-Post	Equivalent emergency room commitments in two pre and post periods	Undeterminable since given cuts in community-based services, there should have been an expected increase in the hospital’s role in providing needed treatment for more disturbed patients. Unknown Missing Confounders.
D.3. Wagner et al Psychology, Public Policy, and Law 2003, 9(½), 145–158. ⁴⁹	North Carolina, USA	OPC N=135, vs Non-OPC N=129; Renewed vs Not-renewed	Average number of monthly service visits per subject	Adjusted Comparison Group Design with regression control. Exclusive of dangerous patients. Random assignment to OPC/Non-OPC failed by having more medication non-compliant and those lacking insight into their illness in OCC group.	Outpatient services received were only significantly associated with crisis (Arrests and Hospital admissions). Of potential study-year indicators of need for services, only the occurrence of psychiatric hospital readmission was associated with greater	< community services

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average frequency of service use.

E. Reports conflating severity, chronicity, and with CTO Hospital Utilization

Study	Jurisdiction	Sample Size (N) by Group Membership	Outcome Criteria	Design & Analysis features	Summary of finding(s)	“No impact” Expectation ^a
E.1. Burgess et al. 2006 <i>Psychiatric Epidemiology</i> 41:574–579. ⁵¹	Victoria, Australia	CTO N=16,216 vs. Non-CTO N=11,211	Admission rate.	Adjusted Comparison Group Design	CTOs associated with increased admission rate	Undeterminable since given cuts in community-based services, with expected increase in hospital role in providing needed treatment for more disturbed patients.
E.2. Zanni & Stavits 2007, <i>Am J Bioeth</i> 7(11):31–41. ⁴⁴	Washington DC, USA	OCC N = 116 vs. Non-OCC N=78	Number of admissions; Admission length	Simple Comparison Group Design	OCCs associated with increased number of admissions and increased admission length.	It would appear that in comparing OCC vs Non-OCC the authors are making the argument that the OCC is more disturbed and in need of treatment rather than suggested in Maughan et al (2014) that this is evidence of OCC failure.
E.3. Patel et al 2013 <i>J of Psychophar</i> 27 (7) 629–637. ⁵³	South London, Endland	CTO N=188, patients prescribed long-acting injection (LAI), N=114 (60.6%) vs. oral medication, N=74(39.4%)	CTO duration	Simple Comparison Group Design	Long-acting injection vs oral medication at CTO outset associated with longer CTO duration.	Undeterminable since given more disturbed CTO patients are more likely to be prescribed LAI than oral medications.
E.4 Castells-Aulet et al 2015 <i>Psychiatric Bulletin</i> 39, 196–199. ⁵⁴	Spain	OCC N=75 vs..Non-OCC=785	Number of admissions, ER visits, average hospital stays over two year period	Adjusted Comparison Group Design: Matched on socio-demographics and hospital history	No significant differences between two groups in admissions, length of stay, and ER visits.	CTO group though matched was different. It was admitted for significantly more aggressive behavior and treatment denial. Comparative outcomes should not have been expected. No difference with a treatment compliant group may be a positive comparison.
E.5 Lera-Calatayud, et al 2014 <i>International Journal of Law and Psychiatry</i> 37: 267–271. ⁵⁵	Valencia, Spain	IOT N=140,	Number of Admissions and days in hospital	Pre/Post Comparison 12 Month	Significant reductions in admissions and hospital stays pre vs post.	Patients with schizophrenia experienced the most significant effect.
E.6 Kisely et al 2004 <i>Br J Psychiatry</i> . 184:432–8. ⁵²	Western Australia	CTO N=265; Non-CTO (matched) N=224; N _{consecutive admissions} =224 (total n=754).	Re-hospitalization rate	Case Control Design	The CTO group had a significantly higher readmission rate: 72% v. 65% and 59% for the matched and consecutive controls	Undeterminable given that CTO group going forward more ill than the control populations

^a“No impact” expectation: Symbol (<, >, , =) indicating relation to baseline or comparison group outcome-measure that the OCC-outcome measure would have in order to be considered a “failure to find” an OCC-effect or to indicate that such a finding was “not determinable” in this study.

^bNA indicates “Not applicable” since the BER system only ranks comparative group studies as opposed to cohort follow-studies.

^cNOS reordered: The BER and NOS systems are coded in opposite directions, with the top rank in BER=1 and in NOS=9. In order to enable a causal ranking for a given study the NOS ranks were reversed to match BER rank ordering (NOS=9 was coded 1, 8 coded 2...5 coded 5). When only one rank in either the NOS or BER system was available that rank was accepted. When both systems ranked a study, the average rank was used.