

# Development and validation of the RQC: a daily contact log for ACT and ICM teams

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**SUMMARY.** **Aim** – Instruments to measure the process - the daily activities of home care workers - have received little attention and may impede research in refining the active ingredients, the clientele best served and continuous quality improvement. We developed a decade ago in Quebec, Canada, a new daily contact log (*relevé quotidien des contacts* or *RQC*) that has now reached in practice 1 million entries. **Methods** – Three features distinguish the RQC development, namely, practical ergonomics, a clear logic, and response categories easy to understand and retain. The instrument is filled following any 10-minute or more contact with or about the client, and covers the location, time and actors of the episode of care, and the nature of the intervention (crisis, representing, accompanying, discussing) in 10 areas (i.e. medication, daily living activities, housing, relationships, substance abuse, legal, etc.). Inter-rater agreement for each RQC response category and rater agreement with a criterion measure (coded vignettes) were evaluated. **Results** – Kappa coefficients and intra-class correlation coefficients yielded results ranging from at least moderate to generally substantial agreement for all 77 response categories. **Conclusions** – The new RQC may support international studies of the implementation and application of various forms of intensive home care, refining its indications, and serves as a clinical and managerial tool to ensure quality of the interventions.

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## INTRODUCTION

Assertive Community Treatment (ACT) is one of the most studied psychosocial programs for severely mentally ill patients. It has shown its efficacy repeatedly as evidenced by a Cochrane Collaboration review (Marshall &

Lockwood, 2000), and is considered an essential component of a balanced mental health care system (Thornicroft & Tansella, 2003). Studies of the implementation of various Assertive Community Treatment (ACT) and Intensive Case Management (ICM) programs in the United States and in the United Kingdom (Fiander *et al.*, 2003; Killaspy *et al.*, 2008) have shown the difficulties in implementing innovative approaches based on the best available evidence when it originates outside the local context, especially when a tradition of community mental health teams is in existence (Burns, 2004). Canadian researchers in Ontario (Dewa *et al.*, 2003; 2001; Durbin *et al.*, 1997) and in Quebec (Ricard *et al.*, 2006) exam-

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ined how such programs were deployed in their respective provinces and measured the intensity of intervention required by their clientele. In order to gauge the level of fidelity of implementation according to standards specific to the ACT model (McGrew & Bond, 1997; McGrew et al., 1994; Teague *et al.*, 1998; 1995), researchers have had to develop instruments to seize the typology, nature and intensity of contacts required by clients in order to describe the characteristics of these programs.

Surprisingly, only one instrument has been formally described with its psychometrics, the Daily Contact Log (DCL) (Brekke, 1987; Brekke & Wolkon, 1988). Its purpose of documenting frequency, intensity, evolution, typology and nature of contacts is a landmark, but the ten categories about the nature of contacts did put, in the same category, the actors (i.e. families), the interventions (i.e. one to one discussion) and the spheres of intervention (i.e. activities of daily living - ADL). The authors only published a reliability exercise of 15 staff members on 2 vignettes that produced moderate to substantial agreement overall (kappa of .58 and .68; percentage agreement of .81 and .85) without details of the various response categories. The extent of the utilization of the DCL in current practice was only indicated by its extensive use in program evaluation and recommendations of its use in regular program monitoring.

It is against this backdrop that we developed the *relevé quotidien des contacts* (RQC) as part of evaluating the implementation of ICM and ACT teams in Quebec. We were concerned with the DCL developed in the USA not matching the local context of a public managed care system and workers in place in Quebec and Canada (Goering *et al.*, 2000), not allowing to more finely describe the nature of home care interventions across various clientele,

about its ease of use in daily practice and the absence of a manual of instructions about all response variables. Three formal features would distinguish the RQC, namely, practical ergonomics, a clear logic, and response categories easy to understand and retain, that distinguish the typology, intensity, nature, types of interventions and spheres of interventions. It therefore differs mainly from the DCL in that it includes a matrix that serves to indicate the client's sphere of life benefiting from a case manager's intervention and a manual of instructions about each possible response variable. We will here present the instrument, its development and details of a reliability exercise with 14 ICM and ACT team workers, on 22 vignettes, evaluating the inter-rater reliability and in relation to a criterion. With over 1 million RQC filled since its inception a decade ago, we think the instrument has sufficient face validity, field work reliability, to be considered as a useful contribution to evaluation research and continuous quality improvement of care in the community of severely mentally ill patients.

## METHODS

### Presentation of the instrument

Figure 1 illustrates the RQC filled after a contact that lasted one hour and thirty minutes. The case manager picked up his client at his home to accompany him in the community to see his psychiatrist at team headquarters. Then, he went along with his client to the drugstore to register a new prescription with the pharmacist. Over the course of this contact, the client discussed relational problems he was having with his parents and asked for advice.

**Relevé quotidien des contacts (RQC) Daily Contact Log**

Client File Number: 15895 Case Manager ID NO: 2006-08-21 Date of Contact: Year 2006 Month 08 Day 21

Client initials: JPU Duration of contact: 1 hour 30 minutes

Contact mode: In person  By telephone

Work shift: Day  Evening  Night

With whom?: Client  Citizen  Intervener  Team member  Family

Where?: Home  Community  Services  Team HQ  Hospital

Intervention Types				
Spheres	Represent	Do with	Discuss	Crisis Intervention
Clinical management	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mental health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medication	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ADL	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Housing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work/School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leisure/Social	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Legal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substance abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1 - Example of RQC.

In this example, the categories “Client”, “Team member” (in this case, the team psychiatrist) and “Intervener” (in this case, a pharmacist), on the one hand, and the categories “Home”, “Community”, “Team Head Quarters” and “Services” (in this case, a pharmacy), on the other hand, were ticked to identify the persons who were the simultaneous and successive subjects of an intervention and the successive places visited over the course of the contact. In the matrix, the intervention type «Clinical management» was ticked for a contact between the client and the team psychiatrist, the intersection between other interventions types and spheres of interventions were ticked three times for

- i) «Represent/Medication» because of a contact with a pharmacist (intervention type - represent; sphere - medication);
- ii) “Do with/ADL” ticked for accompanying the client about his business in the community and
- iii) “Discuss/Relationships” ticked for the verbal emotional-support intervention enacted in response to concerns expressed by the client regarding relational problems within his family. Development of the RQC and users instruction manual.

The RQC was developed by D.G., a former case manager with master degree in social work and psychoeducation, and formatted logically with help of E.D., psychologist in psychoeducation. It defines a contact as an unforeseeable event during which a case manager can come into successive or simultaneous contact with several persons (in person and/or by telephone), move successively from one place to another during the contact, and enact successively or simultaneously several types of interventions targeting different spheres specific to a given client. The RQC documents all interactions of more than 10 minutes (Durbin *et al.*, 1997; Brekke & Test, 1987) that entail a relationship with another person, in the aim of accounting for both short and long contacts. As illustrated in Figure 1, the RQC serves to register date and duration of contact, contact mode (in person and/or by telephone), categories of persons with whom case manager came into contact (client, citizen, intervener, team member, family member), categories of successive places where contact occurred (home, community, service, team headquarters, hospital), and specific spheres of client’s life (mental health, physical health, medication, personal finances, activities of daily living (ADL), housing, work/school, leisure/social activities, relationships, legal matters and substance abuse) targeted by a particular type of intervention (represent, do with, discuss, crisis

intervention). Clinical management is not related to any sphere since it records discussion with other interveners about the client for whatever reason.

Except for duration of contact, all responses on the RQC are dichotomous and not mutually exclusive. All the categories of the RQC can be ticked if the events that occur over the course of a contact meet the category definitions. There is no frequency to indicate on the RQC, only the occurrence or not of an event, and the duration of the various dimensions of the contact need not be specified. The telephone is considered a mode of contact that can be used anywhere rather than in a specific place.

In performing their duties, case managers are called upon to intervene not only with their clients but also with multiple other persons, such as superintendents, pharmacists and the spouses of clients, and they must also consult with the members of their team to orient their interventions. In addition, they are required to travel within the community and to accompany their clients to the supermarket, the social welfare offices and, at times, even to the hospital. Moreover, they must often return to team headquarters to participate in case discussions or to make important calls to facilitate their clients’ access to various social resources. To spare case managers the trouble of writing down the specific functions of the persons dealt with and the multiple sites where the contacts take place, the RQC proposes categories predefined in a user’s guide to record these items. We included the spheres targeted by case-manager interventions as identified by Ryan *et al.* (1997, 1994): activities of daily living are related to the rehabilitation process; housing and personal finances are related to access to services and to all social resources allowing clients to get about in the community; and mental health and medication are related to the psychiatric condition of clients. In fact, as most of these dimensions are systematically covered both in North America (Dewa *et al.*, 2003; 2001; Durbin *et al.*, 1997; Brekke & Test, 1987) and in Europe (Burns *et al.*, 2000; Bjorkman & Hansson, 2000; Hansson *et al.*, 2001), we noted a consensus that seemed to emerge from the literature concerning these spheres and we adopted a compatible terminology.

The logic underlying the RQC is based on precise criteria allowing case managers to discriminate between and classify the multiple professional intervention techniques used with clients and other persons according to a purely instrumental mechanism. Thus, the intervention type “Clinical management” is related to the interaction that occurs among the team members whereas the intervention type “Represent” refers exclusively to the multiple interventions conducted with a “Citizen” in the community, an “Intervener” in the broad sense of the term (e.g.,

pharmacist, police officer, public servant in government agencies) and the client's "Family", without the client being necessarily present. The intervention type "Do with" refers exclusively to the multiple interventions related to accompanying the client or closely supervising tasks or activities in person with the client in order to ensure that they take place (e.g., medication intake), whereas the intervention type "Discuss" refers exclusively to the multiple interventions that consist of verbal exchanges with the client. Finally, the intervention type "Crisis intervention" encompasses all interventions conducted in the context of an emergency response to certain situations that could undermine the client's clinical and social gains.

The users instruction manual of 76 pages double-spaced, encompasses definitions of all the possible 77 responses of the RQC, with examples. Training was offered to a first cohort of 30 case managers of intensive home care part of community mental health teams and part of an evaluation project (Ricard *et al.*, 2006). The experience showed that one half-day of training followed by monitoring and feedback from project coordinator in the first weeks produced consistent ratings. Then the RQC was requested by other teams across the province of Quebec (population 7.5 million inhabitants): similar training was offered, but monitoring was done by team leader. Microsoft Office Access being software readily available in the Quebec public managed care system, an application was developed by J.B. to support local teams and managers in RQC in data entry and reports at the individual and group level, and over time for the various dimensions of the RQC. Since its inception to-day, more than 1 million RQC have been filled, evidence of its face validity and operational feasibility.

#### *Instrument validation procedure*

Beyond its face validity, further validation was performed in evaluating the instrument's reliability (inter-rater agreement and rater agreement with a criterion measure). Accordingly, 2 years after its inception, we invited 14 case managers from three ICM and ACT teams selected at random (names picked blindly) among those reporting to our research team, to rate 22 vignettes that depicted events likely to occur in the course of their work. The case managers were distributed into two groups of 7 raters, with each rater having to code 11 vignettes, as part of a classroom exam format (in silence with no consultation permitted between raters) at our research centre. The exercise took a little more than three hours to complete.

The number of vignettes and raters were chosen in order to have a power of at least .80 for the calculation of statistical tests (intra-class correlations and kappa coefficients) at the alpha level of .05 (Donner & Eliasziw, 1987; Lin *et al.*, 2003).

The 22 vignettes were developed by D.G. with a view to covering the vast majority of the response categories on the RQC that we had experienced with the ICM teams. The length of the vignettes varied from a few lines to four pages of text and could result in the compilation of no RQC, a single one, or even several. In order to gauge agreement between the independent raters and a criterion measure, D.G., J.B. (a psychologist) and L.L. (a seasoned psychiatric head nurse and research coordinator) coded all of the vignettes that served as the benchmark against which rater responses were compared.

In terms of statistics, each RQC comprises a continuous variable (duration of contact) and a series of dichotomous variables. For the dichotomous variables, inter-rater agreement was evaluated by way of the kappa coefficient (Fleiss, 1981; Siegel & Castellan, 1988) using the *MkappaSC.sps* macro of the SPSS application (version 10), which serves to calculate agreement among multiple raters (potentially different for each object) (Siegel & Castellan, 1988). For interpretation purposes, we used the classic criteria proposed by Landis & Koch (1977): 0.21-0.40 Fair agreement; 0.41-0.60 Moderate agreement; 0.61-0.80 Substantial agreement; 0.81-1.00 Almost perfect agreement. The occurrence of rare categories leads sometimes to a lack of variation in responses that renders the computation of the Kappa impossible. In such a situation, it is important and useful to assess the percentage of positive agreement that is the percentage of agreement between the raters for the vignettes that includes the category. We report here the percentage of agreement between the raters and the criterion.

For duration of contacts and number of RQC coded per vignette (varying from 0 to 4), inter-rater agreement was measured by means of the intra-class correlation coefficient (ICC), which is essentially an analysis of variance for ordinal and interval measures (Shrout & Fleiss, 1979). In this study, we utilized version 1 of the ICC in which each vignette was evaluated by a different set of raters (Shrout & Fleiss, 1979).

An analysis of agreement with a criterion was also conducted for both continuous and dichotomous data. It consisted of assessing the percentage of raters in agreement with a specified criterion, this for each category of response and each vignette. Mean percentages were also calculated for each category of response (across all vignettes) and for each vignette (across all categories of response).

## RESULTS

Systematic information about ACT team respondents were not available, but the respondents of the ICM were characterized in another study (Ricard *et al.*, 2006) with a mean mental health workers experience of 16 years (range from 1 to 22 years), half are nurses, the other half educators; 43% had at least some university diploma.

Table I shows the results of the reliability assessment for the 77 potential response categories. For the vast majority of response categories, inter-rater agreement was substantial; only 7 response categories were in the moderate agreement range; and 21 were almost perfect agreement. Also, the percentages of agreement between the raters and the criterion were very high on all 77 categories of the RQC: 66 of them were over .90 and 11 between .80 and .90.

Table I – Distribution, percentages agreement between raters and with criterion, and inter-rater agreement statistics (ICC or kappa).

Variable	Nb vignettes	% agreement	Kappa or ICC	P
Number of RQC	21	95%	0.84 <sup>icc</sup>	****
Total duration of contact (min.)	21	90%	0.97 <sup>icc</sup>	****
<b>Mode of contacts</b>				
In person	21	98%	—	—
By telephone	9	95%	0.84	****
<b>Work shift</b>				
Day	19	100%	1.00	****
Evening	4	98%	0.90	****
Night	2	100%	1.00	****
<b>With whom?</b>				
Client	19	97%	0.77	****
Citizen	5	93%	0.66	****
Intervener	14	91%	0.67	****
Team member	9	97%	0.91	****
Family	5	97%	0.82	****
<b>Where</b>				
Home	12	97%	0.90	****
Community	15	95%	0.80	****
Services	12	90%	0.70	****
Team HQ	3	98%	0.87	****
Hospital	5	97%	0.83	****
<b>Types of intervention</b>				
Mental Health	15	94%	0.71	****
+ Represent	11	88%	0.67	****
+ Do with	1	90%	—	—
+ Discuss	11	87%	0.72	****
+ Crisis Intervention	3	95%	0.53	*
Physical Health	4	90%	0.61	****
+ Represent	1	95%	—	—
+ Do with	3	93%	0.67	***
+ Discuss	3	92%	0.63	****
+ Crisis Intervention	0	100%	—	—
Medication	10	94%	0.84	****
+ Represent	7	94%	0.82	****
+ Do with	3	93%	0.65	****
+ Discuss	8	96%	0.83	****
+ Crisis Intervention	2	95%	0.70	*
Personal finances	12	94%	0.81	****
+ Represent	6	93%	0.75	****
+ Do with	7	90%	0.82	****
+ Discuss	9	85%	0.66	****
+ Crisis Intervention	1	96%	—	—
Daily Living Activities	15	88%	0.75	****
+ Represent	4	84%	0.46	****
+ Do with	13	84%	0.63	****
+ Discuss	9	83%	0.63	****
+ Crisis Intervention	1	95%	—	—
Housing	7	95%	0.84	****
+ Represent	5	94%	0.70	****

segue

Table 1 – *Segue*

Variable	Nb vignettes	% agreement	Kappa or ICC	P
+ Do with	5	94%	0.78	****
+ Discuss	7	93%	0.78	****
+ Crisis Intervention	2	95%	0.54	ns
Work/School	5	99%	0.96	****
+ Represent	2	98%	0.80	**
+ Do with	1	99%	—	—
+ Discuss	4	98%	0.89	****
+ Crisis Intervention	0	100%	—	—
Leisure/Social	5	94%	0.78	****
+ Represent	2	96%	0.65	**
+ Do with	3	95%	0.79	****
+ Discuss	3	97%	0.71	****
+ Crisis Intervention	0	100%	—	—
Relationship	11	84%	0.56	****
+ Represent	6	86%	0.43	****
+ Do with	1	95%	—	—
+ Discuss	7	83%	0.64	****
+ Crisis Intervention	0	99%	—	—
Legal	4	95%	0.70	****
+ Represent	4	88%	0.56	*
+ Do with	3	93%	0.54	—
+ Discuss	4	95%	0.70	****
+ Crisis Intervention	1	98%	—	—
Substance abuse	4	96%	0.79	****
+ Represent	3	95%	0.63	***
+ Do with	1	98%	—	—
+ Discuss	3	97%	0.73	****
+ Crisis Intervention	1	96%	—	—
<b>Summary intervention types</b>				
Clinical management		92%	0.74	****
Represent	17	93%	0.69	****
Do with	18	95%	0.70	****
Discuss	19	99%	0.84	***
Crisis Intervention	3	97%	0.82	****

For p; \* < .05; \*\* < .01; \*\*\* < .001; \*\*\*\* < .0001

When questioned about the value of the RQC for coding the vignettes or, more generally, for representing their daily reality, the raters who took part in the validation exercise in very large part spoke highly of the instrument's utility and fit with practice. In their opinion, no other category needed to be added to the instrument and the existing ones appeared clear and adequately represented the universe of their daily activities. The same comments were made regarding the material coded in the course of the validation exercise, further adding face validity evidence.

## DISCUSSION

We presented here the development of an instrument of measure for reflecting the daily activities of ACT/ICM case managers. We also evaluated the instrument's reliability and showed certain elements of its validity. Analyses of inter-rater agreement and of agreement with

a criterion measure (the authors of the instrument) for a series of vignettes representing numerous situations of practice proved highly conclusive. Each of the instrument's response categories proved highly reliable, in terms of both inter-rater agreement and agreement between raters and the criterion. This validation procedure and detailed report surpassed the exercise carried out for the only instrument which inspired ours, where the inter-rater agreement for the instrument as a whole was reported but not for its components (Brekke, 1987; Brekke & Wolkon, 1988). In our case, we observed each of the instrument's response items to be reliable in numerous situations (the different vignettes) both for a representative sample of users (with varying levels of experience) and against a criterion established by the instrument's authors. Since October 1999, Quebec's case managers in various ACT/ICM teams have maintained a constant level of documentation over long periods of time. The robustness of the RQC in terms of both its conceptual logic and its integrated computer support allows

ACT/ICM teams to use it first and foremost to meet their own monitoring needs. In this regard, the instrument's ergonomics allowed us to meet the challenge of gathering daily data with a long-term continuous approach (Brekke & Test, 1987). RQC also allows to gather four items of program fidelity as measured by the Dartmouth Assertive Community Treatment Scale (Winter & Calsyn, 2000), and we have shown how highly reliable this data collection can be with minimal training, a detailed users instruction manual and initial monitoring of responses. These items are:

- a) percentage of total service delivery time in the community of face to face contacts with clients occurring in vivo (typology of contacts);
- b) total amount of service delivery time per week with clients (intensity of service);
- c) average number of contacts per week with clients (frequency of contact); and
- d) number of contacts per month with significant persons in client's support network, such as family members, landlords, employers or other interveners from different organizations (nature of contacts) (Phillips *et al.*, 2001; Salyers *et al.*, 2003).

In order for case managers to remain motivated to use such an instrument, our experience tells us that it must satisfy their needs. Two elements must be considered in this regard, namely, face validity, which we evidenced in our study, and constancy of use, which we clearly observed at the various sites where we have collected data for the evaluation of ACT/ICM programs since 1999. The integrated computer support program and ergonomics also play a role (Bale *et al.*, 1997). Simultaneously, Scandinavian colleagues developed an elegant daily contact log that has found acceptance among home care workers and that was used for evaluative and monitoring purposes; it does not feature RQC matrix of interventions types and spheres, nor did they report a user manual or reliability (Hansson *et al.*, 2001).

Daily contact logs have their limitations related to what they measure, i.e. processes, and not inputs nor outcomes (Thorncroft & Tansella, 1999). The validation of the RQC is incomplete - we have not shown that 'in vivo' mental health workers would reliably measure duration and all possible interventions; we have not reported its reliability in other states with different systems of care. Numbers of respondents in the reliability exercise can appear small, but the statistics were highly significant and the statistical power high. Moreover, the reliability exer-

cise brought mental health workers from two different regions, and we can report its utilization in many regions, and now in Switzerland. The RQC does not allow measuring the full-time log of mental health workers. Dewa *et al.* (2003) contributed to knowledge of the time inputs required for indirect activities above and beyond a strict definition of relational contacts (e.g., documentation, travel time, administrative meetings), even though their data were gathered intensively from only a few teams over a rather short period of time.

To the extent that all contact logs present pros and cons, we have added to the development of instruments of measure in this field on account of the fact that the qualities inherent to RQC allow to obtain a rather good index of the intensity of services offered by home care ACT/ICM teams, and to do so over a long period of time with multiple teams. They allow us also to constitute a robust database developed with a longitudinal perspective to quantify the volume, typology and nature of their clinical activities (Ricard *et al.*, 2006). It shall be of interest in other jurisdictions for quality monitoring, program evaluation and evaluative research.

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