In a recent editorial, Sharpe has argued that liaison psychiatry services need to develop greater clarity about what they are seeking to achieve, with definable and measurable outcomes. Currently, liaison services have rather a ‘black box’ quality in that they are present in hospitals, they potentially save money, they see a lot of patients, but there has been a struggle to capture the range and type of clinical interventions that they provide.

The Centre for Mental Health published a report outlining the difficulties in measuring outcomes and performance in liaison psychiatry. The authors suggest that the complexity and heterogeneity of service provision rule out a very simple, all-purpose approach to the measurement of outcomes and performance in liaison settings. Instead, they suggest a balanced score card approach to measuring outcome, in which account is taken of inputs (referrals to a service), activities and associated outputs (e.g. what is actually done), and outcome (benefits in health that result from the service outputs).

Aims and method To develop a simple, pragmatic typology to characterise the nature of liaison interventions delivered by a liaison service in a National Health Service setting. We carried out a retrospective electronic case-note review of referrals to a ward-based liaison psychiatry service.

Results Three hundred and forty-four patients were referred to the service over a 12-month period. Ten different types of liaison interventions were identified, with the most common interventions being diagnosis (112 patients, 32.6%), medication management (57 patients, 16.6%), risk assessment and treatment (56 patients, 16.3% each). Mental Health Act work accounted for the greatest number of contacts per patient (median 7).

Clinical implications There are inherent limitations in any single-site observational study, as site-specific results cannot be generalised to other liaison services. The intervention categories we developed, however, are easy to use and will provide a way of comparing and benchmarking the range of interventions delivered by different liaison psychiatry services.

Declaration of interest None.
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entries (if present) describing subsequent contacts and interventions, plus our own clinical knowledge of the patient in question. We used a modified open-card sorting method to group referrals according to different kinds of service interventions. We developed seven distinct, definable categories, which captured the main clinical intervention: (1) diagnosis/formulation; (2) assessment of risk; (3) medication management; (4) management of disturbed behaviour; (5) assessment of mental capacity; (6) treatment of non-psychosis; and (7) treatment of psychosis.

These preliminary categories were then further refined after discussion with senior consultant colleagues and presentation at a Psychiatric Liaison Accreditation Network (PLAN) 1-day meeting, a Liaison Psychiatry Young Consultants' and Trainees' meeting and the preliminary findings from a working group set up by the Liaison Faculty of the Royal College of Psychiatrists to develop an outcome framework for liaison psychiatry. The two treatment categories (treatment of non-psychosis and treatment of psychosis) were collapsed into one category of ‘treatment’ and four other categories were added: assessment and treatment under the Mental Health Act 1983; brief psychological interventions; providing guidance/advice; and signposting/referring on. Thus, the final ten categories are:

1. Assessment and diagnosis/formulation: joint working with medical or surgical teams to establish a diagnosis following uncertainty regarding symptom presentation
2. Providing guidance/advice: verbal or written guidance or advice provided by the liaison team about common psychological problems, lifestyle changes or alcohol consumption
3. Signposting/referring on: the individual is given information about other relevant statutory or non-statutory agencies, or referred to another service by a liaison team member
4. Assessment and management of risk: the assessment and judgement of an individual’s immediate risk of self-harm or harm to others; the assessment is usually followed by a management plan tailored to the severity and nature of current risk – risk changes with time, so it is not uncommon for multiple assessments of risk to be carried out
5. Assessment of mental capacity: the assessment of capacity to consent to a therapeutic procedure or post-discharge placement, or ability to self-discharge
6. Assessment and treatment under the Mental Health Act: the use of the Mental Health Act in the general hospital setting to detain an individual for assessment or treatment of their mental health problems
7. Medication management: a consultation about psychotropic medication which requires stopping, restarting, switching or adjusting because of physical health problems; such decisions usually entail expert knowledge regarding the use of psychotropic drugs in physically unwell patients
8. Management of disturbed behaviour: the active management of a patient with disturbed behaviour as a consequence of some form of mental health problem while in the general hospital setting
9. Brief psychological interventions: the treatment of an individual’s psychological problems using a brief psychological intervention
10. Treatment: the starting or continuation of treatment for a diagnosed mental health problem; the treatment is most often some form of psychotropic medication coupled with advice about management.

Case-note review

We carried out a retrospective case review of the electronic records of consecutive referrals to the ward-based service for 12 months from 18 June 2013 to 17 June 2014. We collected the following details: age; gender; health district of origin; the number of face-to-face contacts carried out by the team; the duration of time the team had ongoing contact with the patient (days); the reason for referral; psychiatric diagnosis using clinical judgement according to ICD-10 criteria; whether the Mental Health Act was employed; and disposal.

We assigned each patient seen by the service to one of the ten intervention categories. The ten criteria are not mutually exclusive, but for our main analysis we focused on the principal intervention by the team for each individual referral (i.e. the type of intervention which had taken up the greatest proportion of liaison input). Assignment was carried out on a consensus basis within the team.

We used face-to-face contacts to estimate the workload of the service. The minimum work involved in each face-to-face assessment includes the following: going to the hospital ward; reviewing the patient’s notes; speaking to a member of nursing staff to obtain an update regarding the patient’s progress; finding a private room to interview the patient; interviewing and assessing the patient; feeding back to nursing staff; writing a summary of the contact with specific advice in the medical notes; and entering a more detailed assessment on the mental health trust’s electronic record system. Most face-to-face contacts usually, but not always, involve discussion with the medical or surgical team involved in the patient’s care.

There are many other aspects of liaison work that are not captured by ‘face-to-face’ contact activity, including attendance at multidisciplinary meetings, telephone calls, liaising with other health professionals, relatives, carers, pharmacy, writing letters, writing reports, providing education and training, service evaluation, development and management of services, etc. However, it is very difficult to reliably record all this other activity, so we used ‘face-to-face’ contacts as a proxy measure for overall workload.

Where the data are normally distributed, summary scores are presented as means and standard deviations. The service activity data were not normally distributed, so summary scores are presented in the form of medians and interquartile ranges (IQRs). Kruskal–Wallis tests were used to compare the continuous activity data.

We determined that as the study was concerned with service evaluation, it was not necessary to seek approval from a research ethics committee. Only clinicians working for the liaison service, who had been involved in direct clinical patient care, had access to patients’ electronic records (in other words, the entries the clinicians had written themselves). All clinical material included in this report has been anonymised and all identifying features removed.
Results

The service received 344 referrals from 18 June 2013 to 17 June 2014. The average age of people seen was 47.7 years (s.d. = 15.1), and 184 (53.5%) were female. At any one time, between 8 and 15 patients were under review by the team.

Two hundred and twenty-seven (66.0%) referrals were from medical wards, 59 (17.2%) from surgical wards, 31 (9.0%) from the women’s hospital and 23 (6.7%) from the critical care unit. One referral came from the eye hospital and a further three were from the liaison for older adults service of patients who were over 65 years old but who were best managed by the adults of working-age team.

Approximately half of the referrals (n = 168, 48.8%) involved people who lived in the locality of the hospital. The other half involved people from 18 different health districts across the north of England, and 17 patients were homeless.

Just under half of the people referred received a single assessment (n = 157, 45.6%). A quarter of people were seen between two and four times (n = 96, 27.9%), 20.1% (n = 69) were seen between five and ten times and a small number of people required more than ten contacts (n = 22, 6.4%). The total number of face-to-face contacts was 1259 for the 12-month period, with the average number per patient at 3.7 (s.d. = 4.6). The small number of patients who required more than ten contacts accounted for nearly a third of the total workload of the service (P = 0.003) and duration of contact (P = 0.009) using the Kruskal–Wallis test. The groups with the largest median number of contacts were individuals with schizophrenia, bipolar affective disorder and somatoform disorders, with a median of 3 contacts.

Table 2 shows the service activity for each principal intervention category. Of the 344 patients referred to the service over 12 months, 4 people declined any help from the service, so were not allocated to an intervention. Of the remainder, the most frequently employed intervention was diagnosis (n = 112 patients, 32.6%), followed by medication management (n = 57 patients, 16.6%), then risk assessment and treatment (both 56 patients 16.3% each), followed by management of behavioural disturbance (n = 28 patients, 8.2%). Although assessment or treatment using the Mental Health Act only accounted for 23 patients (6.7% of referrals), this work involved the highest median number of contacts (7, IQR 3–12), and a total number of 230 (18.3%) face-to-face contacts. There were no patients allocated to ‘brief psychological interventions’, ‘signposting/referring on’ or ‘providing advice/guidance’.

There were significant differences between principal intervention groups for both number of contacts (P < 0.001) and duration of contact (P < 0.001) using the Kruskal–Wallis tests (Table 2). The Mental Health Act group had the

| Type of clinical problem | Referrals | Face-to-face contacts | Face-to-face contacts | Time in contact with service, days |
|--------------------------|-----------|-----------------------|----------------------|-----------------------------------|
|                          | n (%)     | Median (IQR)          |                      |                                   |
| Depression               | 135 (39.2)| 506 (40.2)            | 2 (1–5)              | 7 (1–14)                          |
| Schizophrenia            | 51 (14.8) | 288 (22.9)            | 3 (1–7)              | 7 (1–14)                          |
| Bipolar affective disorder | 25 (7.3) | 98 (7.8)              | 3 (1–4.5)            | 4 (1–10)                          |
| Delirium                 | 23 (6.7)  | 84 (6.7)              | 2 (1–4)              | 5 (1–14)                          |
| Substance misuse         | 16 (4.7)  | 58 (4.6)              | 1.5 (1–2)            | 2 (1–7)                           |
| Medically unexplained symptoms | 9 (2.6) | 47 (3.7)              | 3 (1–7.5)            | 3 (1–34)                          |
| No current mental health problem | 25 (7.3) | 40 (3.2)              | 1 (1–1.5)            | 1 (1–4)                           |
| Personality disorder     | 13 (3.8)  | 36 (2.9)              | 1 (1–3.5)            | 1 (1–9.5)                         |
| Korsakoff syndrome       | 12 (3.5)  | 27 (2.1)              | 1.5 (1–2)            | 4 (1–17)                          |
| Adjustment disorder      | 10 (2.9)  | 21 (1.7)              | 1 (1–2)              | 1 (1–4.75)                        |
| Anxiety disorder         | 12 (3.5)  | 19 (1.5)              | 1 (1–1.75)           | 1 (1–1.75)                        |
| Eating disorder          | 5 (1.5)   | 22 (1.7)              | 3 (1.5–8)            | 7 (2–14.5)                        |
| Intellectual disability  | 1 (0.3)   | 1 (0.1)               | 1                    | 1                                 |
| Asperger syndrome        | 1 (0.3)   | 1 (0.1)               | 1                    | 1                                 |
| Dementia                 | 6 (1.7)   | 11 (0.9)              | 1 (1–2.75)           | 1 (1–6.25)                        |
| Total                    | 344 (100) | 1259 (100)            | 2 (1–5)              | 4 (1–13)                          |

IQR, interquartile range.
The complexity of patient problems, the professional mix and staffing of services, the diversity of patient problems, the mix of staff and different settings, including emergency department work, acute hospital work and out-patient treatment. As such, liaison services are likely to vary dramatically in workload. A third of the work involves liaison work, acute hospital work and out-patient treatment. A major problem in the clinical evaluation of liaison services has been their diversity, with different mixes of staff and different settings, including emergency department work, acute hospital work and out-patient treatment. As such, liaison services are likely to vary dramatically in their intervention profiles. However, if we delineate and describe the type of interventions which are delivered by a service, it enables us to look inside the ‘black box’ and maintain stability, rather than see positive improvement.

In the late 1980s, Huyse and colleagues developed a typology to operationalise the recommendations given by liaison specialists to referring teams. This was an important development, but the measure was intended for mainly one-off consultations, where advice only was provided. Our intention was to develop a typology which was practical and easy to apply in a clinical liaison setting, which could provide an indication of the type of work undertaken by a liaison team. By using the typology, we were able to determine that approximately half the workload of our service involves the treatment on medical and surgical wards of patients with mental health problems, the management of behavioural disturbance and medication management. The treatment provided includes the management and treatment of patients detained under the Mental Health Act to the acute hospital, which accounts for a fifth of the workload of the service. A third of the work involves risk assessment and diagnosis.

Table 2 provides examples of patients assigned to each of the different liaison interventions, together with the reason for referral, their psychiatric diagnosis and the degree of contact with the service. Two examples are given for each intervention to illustrate how the liaison typology was used in clinical practice.

| Interventions                             | Referrals n (%) | Number of contacts Median (IQR) | Total number of contacts n (%) | Time in contact with the service, days Median (IQR) |
|------------------------------------------|----------------|---------------------------------|-------------------------------|-----------------------------------|
| Assessment and diagnosis/formulation    | 112 (32.6)     | 1.5 (1–3)                       | 316 (25.1)                    | 3 (1.0–8.0)                      |
| Assessment and management of risk        | 56 (16.3)      | 1.0 (1–2)                       | 139 (11)                      | 1 (1–6.5)                        |
| Assessment of mental capacity            | 8 (2.3)        | 1.0 (1–1.8)                     | 10 (0.8)                      | 1 (1–6.3)                        |
| Mental Health Act 1983 assessment        | 23 (6.7)       | 7.0 (3–12)                      | 230 (18.3)                    | 14 (6–30.0)                      |
| Medication management                    | 57 (16.6)      | 3.0 (1–5)                       | 208 (16.5)                    | 6 (1–14.0)                       |
| Management of disturbed behaviour        | 28 (8.1)       | 2.0 (1–5)                       | 105 (8.3)                     | 5 (1–8.8)                        |
| Treatment                                | 56 (16.3)      | 2.5 (1–6)                       | 245 (19.5)                    | 7 (1–21.0)                       |
| No engagement                            | 4 (1.2)        | 1.0 (1–2.5)                     | 6 (0.5)                       | 1 (1–10.8)                       |
| Total                                    | 344            | 2.0 (1–5)                       | 1259                          | 4 (1–13)                         |

IQR, interquartile range.

Table 2 Referrals and service workload according to the principal intervention categories

Approximately half of all the patients referred to our service were seen on at least two occasions, 7 days apart. This suggests that some form of paired assessment of outcome would be feasible for 50% of all referrals we receive. The different intervention categories allow us to specify in Sharpe’s terms what we are seeking to achieve for each kind of intervention. For example, in the ‘treatment’ and ‘management of behavioural disturbance’ categories, we would expect to see an improvement in patients’ mental health, if rated by an appropriate measure. However, if the intervention primarily involves ‘medication management’, the intention for patients assigned to this category is to prevent relapse by judicious switching or other appropriate action regarding the patient’s psychotropic medication. The aim in this case for any kind of paired measurement would be to maintain stability, rather than see positive improvement.

Discussion

Previous published work on the evaluation of liaison psychiatry services has predominantly focused on the following areas: activity and nature of referrals, the complexity of patient problems, the professional mix and staffing of services, training and quality outcomes. There has been relatively little work which has addressed directly either the ‘outputs’ or the outcome of liaison services. It is the outputs of liaison work that this study aimed to address, as we argue that until the outputs can be better characterised, it is difficult to determine appropriate outcome measures.

In the late 1980s, Huyse and colleagues developed a typology to operationalise the recommendations given by liaison specialists to referring teams. This was an important development, but the measure was intended for mainly one-off consultations, where advice only was provided. Our intention was to develop a typology which was practical and easy to apply in a clinical liaison setting, which could provide an indication of the type of work undertaken by a liaison team. By using the typology, we were able to determine that approximately half the workload of our service involves the treatment on medical and surgical wards of patients with mental health problems, the management of behavioural disturbance and medication management. The treatment provided includes the management and treatment of patients detained under the Mental Health Act to the acute hospital, which accounts for a fifth of the workload of the service. A third of the work involves risk assessment and diagnosis.

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A major problem in the clinical evaluation of liaison services has been their diversity, with different mixes of staff and different settings, including emergency department work, acute hospital work and out-patient treatment. As such, liaison services are likely to vary dramatically in their intervention profiles. However, if we delineate and describe the type of interventions which are delivered by a service, it enables us to look inside the ‘black box’ and convey to our general hospital colleagues, managers and commissioners what we actually provide, and what we are hoping to achieve.

Three of the new categories, which were suggested by liaison colleagues (brief psychological intervention, signposting/referring on, providing guidance and advice) were not relevant for our own service, but may be important interventions for other kinds of liaison services.

| No engagement | Assessment and diagnosis/formulation | Assessment and management of risk | Assessment of mental capacity | Mental Health Act 1983 assessment | Medication management | Management of disturbed behaviour | Treatment | Total |
|---------------|-------------------------------------|----------------------------------|-------------------------------|---------------------------------|----------------------|---------------------------------|----------|-------|
| 4 (1.2)       | 112 (32.6)                          | 56 (16.3)                        | 8 (2.3)                       | 23 (6.7)                       | 57 (16.6)            | 28 (8.1)                        | 56 (16.3) | 344   |
| 1.0 (1–2.5)   | 1.5 (1–3)                           | 1.0 (1–2)                       | 1.0 (1–1.8)                   | 7.0 (3–12)                     | 3.0 (1–5)            | 2.0 (1–5)                       | 2.5 (1–6) |       |
| 6 (0.5)       | 316 (25.1)                          | 139 (11)                        | 10 (0.8)                      | 230 (18.3)                     | 208 (16.5)           | 105 (8.3)                       | 245 (19.5) |       |
| 1 (1–10.8)    | 3 (1.0–8.0)                         | 1 (1–6.5)                       | 1 (1–6.3)                     | 14 (6–30.0)                    | 6 (1–14.0)           | 5 (1–8.8)                       | 7 (1–21.0) |       |
|               |                                    |                                  |                               |                                 |                      |                                 |          |       |
|               | Time in contact with the service, days Median (IQR) |                                  |                               |                                 |                      |                                 |          |       |
|               | 4 (1–13)                            |                                  |                               |                                 |                      |                                 |          |       |
| Liaison intervention | Age range and gender | Reason for referral | Medical condition | Psychiatric diagnosis | Outcome |
|----------------------|----------------------|---------------------|-------------------|----------------------|---------|
| Assessment and diagnosis-formulation | 16–20 years, female 60–69 years, female | Developed ‘fit’ post surgery ward round Psychogenic vomiting | Admitted for tonsillectomy Vomiting, query cause Known history of bipolar affective disorder | Non-epileptiform attack disorder Intracranial pathology suspected as GCS low | Explanation of nature of symptoms, engagement of patient with biopsychosocial formulation Referral for outpatient psychological treatment Request for urgent scan which showed hydrocephalus and brain metastases Patient transferred to neuroscience centre |
| Assessment and management of risk | 60–70 years, male 40–50 years, male | Lacerated throat with Stanley knife Stabbed self in chest | Severe trauma to neck requiring tracheostomy and later PEG Surgery to repair multiple wounds to chest wall and explore damage to heart | Depressive disorder Adjustment disorder | Ongoing risk assessment while in-patient with treatment Principal decision involved judgement concerning discharge to home treatment rather than in-patient psychiatric bed Ongoing risk assessment while in hospital with discharge to HTT |
| Assessment of mental capacity | 30–40 years, female 50–59 years, female | Refusing investigations and treatment Thought by staff to have paranoid ideas Refusing medical treatment Known diagnosis of schizophrenia | HIV multifocal leukoencephalopathy Chest infection | Delirium Delirium, schizophrenia | Determine not to have capacity Best interests meeting arranged to determine further medical treatment plan Determine not to have capacity Best interests meeting arranged |
| Mental Health Act assessment | 50–60 years, female 40–50 years, female | Paranoia Confusion Visual and tactile hallucinations | Confusion caused by chest infection which was treated Admitted for investigation of confusion No medical cause found | Schizophrenia Hypomania, although very organic presentation | Detained under the Mental Health Act as refusing psychiatric treatment and considered to be at risk to self through serious neglect Transferred to in-patient psychiatric bed Detained under the Mental Health Act as trying to leave ward naked Treated on ward for 10 days while awaiting psychiatric bed Responded to treatment so Section 2 rescinded and discharged to local CRT |
| Medication management | 40–50 years, female 50–60 years, male | Lithium stopped Query about treatment Clozapine stopped while in hospital for 10 days | Diabetes insipidus secondary to lithium Admitted to ITU with severe chest infection Noted to have ejection fraction of 30% | Bipolar affective disorder Schizophrenia | High risk of relapse so started on valproate Dose titrated up and discharged to CMHT Physical condition improved and ejection fraction improved Initial bedside measure was probably inaccurate Clozapine restarted and re-titrated after risks and benefits discussed with patient |
| Management of disturbed behaviour | 40–49 years, male 40–49 years, female | Repeated self-harm on ward Leaving ward to drink alcohol and also drinking from alcohol gel dispensers on ward | Epilepsy Alcoholic liver disease | Personality disorder Personality disorder | Liaison team worked with staff to de-escalate behaviour and plan safe discharge with appropriate follow-up Liaison team worked with staff to establish a clear management plan and defuse negative staff attitudes |
| Treatment | 40–50 years, male 30–40 years, female | Confusion – query symptoms psychogenic, not eating or drinking Postnatal risk assessment | Confusion and weakness of unknown cause Normal full-term delivery History of bipolar affective disorder | Psychotic depression Hypomania | Treatment with antidepressants and antipsychotics started immediately Patient discharged to HTT Treatment started immediately Condition settled within 5 days and patient discharged safely with baby, with support from local CRT |

CMHT, community mental health team; CRT, crisis resolution team; GCS, Glasgow Coma Scale; HTT, home treatment team; ITU, intensive therapy unit; PEG, percutaneous endoscopic gastrostomy.
The number of referrals did not capture the workload of our service, which was better provided by the number of face-to-face contacts for each referral, as some patients required intensive input from the team, particularly those detained under the Mental Health Act. The actual number of face-to-face contacts by the adults of working-age service was very similar to the number of contacts for the team covering older adults at the same hospital. The older adult team received many more referrals during the same period, but had fewer contacts per patient than the adults of working-age team.

Risk assessment and diagnosis are categories that could be assumed to involve one-off assessments by a liaison service; however, referrals involving these two kinds of intervention required a median of two to three face-to-face contacts. Many of the risk assessments involved patients who had been admitted following near-fatal self-harm, and required ongoing assessment of risk as their physical condition improved. Diagnosis also required more than one assessment in many cases, especially if there were complex issues.

Using the data from the intervention categories, together with case illustrations, helps to sketch out the work of the service. A picture emerges of a service which provides assessment, treatment and management of patients with complex and high-risk mental health problems in the setting of an acute hospital. For at least half the patients, the liaison service operates almost like a cross between a crisis resolution service and an in-patient psychiatric unit (but in the setting of the acute hospital). The anonymised case descriptions illustrate the bi-directional interplay between psychological and physical problems, which can be hard to convey using numerical or quantitative data.

The intervention categories have recently been incorporated into the Framework for Routine Outcome Measurement in Liaison Psychiatry (FROM-LP), and have been termed the IRAC scales (Identify and Rate the Aim of the Contact). It is suggested they are used in conjunction with a variety of recommended outcome measures, depending on whether the patient is seen on one, or more than one, occasion.

There are inherent limitations in any single-site observational study, and our results are not generalisable to other liaison services. The study was conducted in a large inner-city teaching hospital, and the patients referred to the service may not be typical of those seen by other liaison services. Nevertheless, the methods we employed can be reproduced by any liaison service and will provide a way of comparing and benchmarking services. We believe this study provides preliminary support for the new guidance from the Faculty of Liaison Psychiatry of the Royal College of Psychiatrists regarding outcome measurement.

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