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((medical OR physical OR medicine OR mixed OR med) NEAR/3 (psychiatr* OR mental OR psych) NEAR/6 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)):ab,ti OR (((joint OR joined OR mixed OR combined OR integrated) NEAR/6 (unit OR units OR ward OR wards)) OR 'medically complex' OR 'difficult medical' OR 'complexity intervention'):ab,ti AND (psychiatry/exp OR 'psychiatric department'/de OR psychiatrist/de OR (psychiatr*):ad,ab,ti)

Medline (OvidSP)

((medical OR physical OR medicine OR mixed OR med) ADJ3 (psychiatr* OR mental OR psych) ADJ6 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)):ab,ti. OR (((joint OR joined OR mixed OR combined OR integrated) ADJ6 (unit OR units OR ward OR wards)).ab,ti. OR "medically complex" OR "difficult medical" OR "complexity intervention").in,ab,ti. AND (exp psychiatry/ OR "Psychiatric Department, Hospital"/ OR (psychiatr*).in,ab,ti.)

PsycINFO (OvidSP)

((medical OR physical OR medicine OR mixed OR med) ADJ3 (psychiatr* OR mental OR psych) ADJ6 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)):ab,ti. OR (((joint OR joined OR mixed OR combined OR integrated) ADJ6 (unit OR units OR ward OR wards)).ab,ti. OR "medically complex" OR "difficult medical" OR "complexity intervention").in,ab,ti. AND (exp psychiatry/ OR exp "Psychiatric Units"/ OR (psychiatr*).in,ab,ti.)

Cochrane

((medical OR physical OR medicine OR mixed OR med) NEAR/3 (psychiatr* OR mental OR psych) NEAR/6 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)):ab,ti OR (((joint OR joined OR mixed OR combined OR integrated) NEAR/6 (unit OR units OR ward OR wards)) OR 'medically complex' OR 'difficult medical' OR 'complexity intervention'):ab,ti AND ((psychiatr*):ab,ti)

Web-of-science

TS=(((medical OR physical OR medicine OR mixed OR med) NEAR/2 (psychiatr* OR mental OR psych) NEAR/5 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)) OR (((joint OR joined OR mixed OR combined OR integrated) NEAR/5 (unit OR units OR ward OR wards)) OR "medically complex" OR "difficult medical" OR "complexity intervention")) AND ((psychiatr*))

Scopus

TITLE-ABS-KEY(((medical OR physical OR medicine OR mixed OR med) W/2 (psychiatr* OR mental OR psych) W/5 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)) OR (((joint OR joined OR mixed OR combined OR integrated) W/5 (unit OR units OR ward OR wards)) OR "medically complex" OR "difficult medical" OR "complexity intervention")) AND ((psychiatr*))

CINAHL

((medical OR physical OR medicine OR mixed OR med) N3 (psychiatr* OR mental OR psych) N6 (unit OR units OR department* OR ward OR wards OR inpatient* OR setting* OR service*)) OR (((joint OR joined OR mixed OR combined OR integrated) N6 (unit OR units OR ward OR wards)) OR "medically complex" OR "difficult medical" OR "complexity intervention")) AND (MH psychiatry+ OR MH "Psychiatric Units+" OR (psychiatr*))

Google Scholar

"medical|physical|medicine|mixed|med psychiatry|mental|psych unit|units|department|ward|wards|setting|service"

Appendix 2: included and excluded papers

Figure 1 - Prisma flow diagram

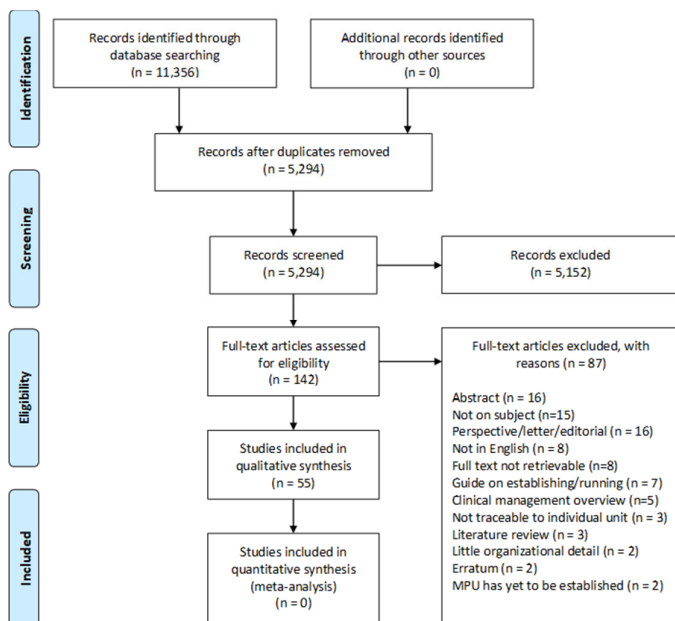


Table A2-1 – List of included papers, study types and number of patients.

1	Arie and Dunn 1973 (Arie & Dunn, 1973)	<i>Descriptive, chart review</i>	n=85
2	Freeberg, Kiner, and Walker 1976 (Freeberg, Kiner, & Walker, 1976)	<i>Descriptive</i>	NA
3	Pitt and Silver (Pitt & Silver, 1980)	<i>Descriptive, chart review</i>	n=1576 admissions
4	Withersty et al. 1980 (Withersty, Shemo, Waldman, & Stevenson, 1980)	<i>Comparative, survey-based pre- and post-unit conversion comparison</i>	n=22 for pre- conversion cohort and n=51 for post-conversion cohort.
5	Markoff et al. 1981 (Markoff, Yano, Hsu, & Wright, 1981)	<i>Descriptive, evaluation of first 6 months of operation and survey amongst non-psychiatrist physicians</i>	n=101 patients with a primary psychiatric diagnosis and an estimated 2/3 of 193 patients with a secondary psychiatric diagnosis
6	Morgan and Withersty 1981 (Morgan & Withersty, 1981)	<i>Descriptive, telephone survey on patient acceptance</i>	NA
7	Koran and Barnes 1982 (Koran & Barnes, 1982)	<i>Descriptive, clinical vignettes</i>	NA
8	Shemo et al. 1982 (Shemo, Ballenger, Yazel, & Spradlin, 1982)	<i>Descriptive, clinical vignettes</i>	NA
9	Stoudemire et al. 1983 (Stoudemire, Brown, McLeod, Stewart, & Houpt, 1983)	<i>Descriptive</i>	NA
10	Hoffman 1984 (Hoffman, 1984)	<i>Descriptive, evaluation of clinical activities</i>	n=275 admissions
11	Fava et al. 1985 (Fava, Wise, Molnar, & Zielezny, 1985)	<i>Comparative, retrospective chart review</i>	n=600 patients admitted to an MPU (n=200), a conventional psychiatric unit (n=200) and medical-surgical units with psychiatric consultation (n=200)
12	Fogel 1985 (Fogel, 1985)	<i>Comparative, pre- and post-unit conversion comparison and clinical vignettes</i>	NA
13	Fogel, Stoudemire, and Houpt 1985 (Fogel, Stoudemire, & Houpt, 1985)	<i>Comparative, qualitative comparison of clinical and administrative aspects of a psych-med and med-psych unit</i>	NA
14	Goodman 1985 (Goodman, 1985)	<i>Descriptive, chart review?</i>	n=289
15	Molnar, Fava, and Zielezny 1985 (Molnar, Fava, & Zielezny, 1985)	<i>Comparative, chart review</i>	n=600 patients admitted to an MPU (n=200), a conventional psychiatric unit (n=200) and medical-surgical units with psychiatric consultation (n=200)

16	Stoudemire, Kahn, and Brown 1985 (Stoudemire, Kahn, Brown, Linfors, & Houpt, 1985)	<i>Comparative</i> , chart review	n=212
17	Moss and James 1986 (Moss & James, 1986)	<i>Descriptive</i> , pilot study of functional status at admission and discharge, clinical vignettes	n=68
18	Muqtadir, Hamann, and Molnar 1986 (Muqtadir, Hamann, & Molnar, 1986)	<i>Descriptive</i> , clinical management overview of a cohort of pregnant psychotic patients	n=10 patients, 11 pregnancies
19	Young and Harsch 1986 (Young & Harsch, 1986)	<i>Descriptive</i> , chart review?, comparison of MPU and consultation service patient characteristics n~91 patients in a twelve-month period	n~91 patients
20	White 1988 (White, 1988)	<i>Descriptive</i> , explanation about the use of a medical support group	NA
21	Harsch, LeCann, and Ciaccio 1989 (Harsch, LeCann, & Ciaccio, 1989)	<i>Descriptive</i> , discussion of the clinical problems encountered on the MPU	NA
22	Kathol, Krummel, and Shakespeare 1989 (Kathol, Krummel, & Shakespeare, 1989)	<i>Descriptive</i> , description of resident education program and resident evaluations of the MPU	NA
23	Kiernan and Stoudemire 1989 (Kiernan & Stoudemire, 1989)	<i>Descriptive</i> , description of an occupational therapy program	NA
24	Young and Harsch 1989 (Young & Harsch, 1989)	<i>Comparative</i> Retrospective cohort study (PMU vs. traditional psychiatric units and medical unit)	n=358 discharges
25	Bruns and Stoudemire 1990 (Bruns & Stoudemire, 1990)	<i>Descriptive</i> , chart review	n=262 discharges
26	Kahan and Sexson 1991 (Kahan & Sexson)	<i>Descriptive</i> , second part of series (Sexson and Kahan 1991) on organization and development of child and adolescent MPUs, clinical vignettes	n=237 patients
27	Sexson and Kahan 1991 (Sexson & Kahan, 1991)	<i>Descriptive</i> , first part of series (Kahan and Sexson 1991) on organization and development of child and adolescent MPUs.	n=100 admissions involving 85 patients
28	Stoudemire, Hill, Morris and Markwalter (Stoudemire, Hill, Morris, & Markwalter, 1991)	<i>Descriptive</i>	n=15 depressed patients with and without cognitive impairment
29	Swenson and Mai 1992 (Swenson & Mai, 1992)	<i>Comparative</i> , chart review comparing the MPU to the geriatric psychiatry inpatient service and three general adult psychiatry inpatient services, clinical vignettes	NA
30	Buckley, Freyne, and Walshe 1994 (Buckley, Freyne, & Walshe, 1994)	<i>Descriptive</i> , chart review	n=139 patients
31	Raney and Siegel 1994 (Raney & Siegel, 1994)	<i>Descriptive</i> , clinical vignettes	NA
32	Campo and Raney 1995 (Campo & Raney, 1995)	<i>Descriptive</i>	NA
33	Gertler 1995 (Gertler, Kopec-Schrader, & Blackwell, 1995)	<i>Comparative</i> , chart review comparing MPU to general psychiatry unit patients	n=73 (MPU), 173 (general psychiatry unit)
34	Porello et al. 1995 (Porello, Madsen, Futterman, & Moak, 1995)	<i>Descriptive</i> , chart review	n=290
35	Trappler, Greenberg and Friedman 1995 (Trappler, Greenberg, & Friedman, 1995)	<i>Descriptive</i>	
36	Nomura et al. 1996 (Nomura et al., 1996)	<i>Comparative</i> , chart review concerning the clinical experience and pre-post unit conversion comparison of LOS.	n=627 admissions
37	Farragher and Walsh 1998 (Farragher & Walsh, 1998)	<i>Descriptive</i> , prospective cohort study, clinical vignettes	n=89
38	Fennig and Fennig 1999 (S. Fennig & S. Fennig, 1999)	<i>Descriptive</i> , clinical experience and clinical vignettes	NA
39	Fennig and Fennig 1999 (S Fennig & S Fennig, 1999)	<i>Descriptive</i> , protocol for encopresis and clinical vignettes	NA
40	Kishi and Kathol 1999 (Kishi & Kathol, 1999)	<i>Comparative</i> , prospective, structured chart assessment MPU versus internal medicine units	n=105 MPU patients and 105 IMW patients
41	Protheroe and House 1999 (Protheroe & House, 1999)	<i>Descriptive</i> , chart review ns in a 1-year period	n=97 admissions involving 83 patients

42	Chang et al. 2001 (Chang, Lee, Lee, Yang, & Wen, 2001)	<i>Descriptive</i> , chart review on predictors of re-admission.	n=196 admissions involving 164 patients
43	Fennig, Fennig and Roe 2002 (Fennig, Fennig, & Roe, 2002)	<i>Descriptive</i> , clinical management of anorexia and clinical vignettes	n=148 admissions
44	Eytan et al., 2004 (Eytan, Bovet, Gex-Fabry, Alberque, & Ferrero, 2004)	<i>Descriptive</i> , patient satisfaction survey	n=60 patients
45	Maier, Wachtler, and Hofmann 2007 (Maier, Wachtler, & Hofmann, 2007)	<i>Comparative</i> , pre-post unit conversion comparison using prospective anonymous patient data, a staff survey and staff interviews	n=2158 patients
46	Astell, Clark, and Hartley 2008 (Astell, Clark, & Hartley, 2008)	<i>Descriptive</i> , prediction model identifying predictors of discharge destination using prospective cohort data	n=234 patients
47	Hanna et al. 2008 (Hanna, Woolley, Brown, & Kesavan, 2008)	<i>Descriptive</i> , chart review	n=50 admissions
48	Alberque et al. 2009 (Alberque, Gex-Fabry, Whitaker-Clinch, & Eytan, 2009)	<i>Descriptive</i> , chart review	n=1,380 hospitalizations involving 1,078 patients
49	Leue et al. 2010 (Leue, Driessen, Strik, & Drukker, 2010)	<i>Comparative</i> , controlled pre-post unit conversion comparison (MPU versus medical wards) of hospital costs	n=458 patients, n=174 MPU patients that could be linked to the Psychiatric Case Register of the Wider Maastricht area in the study period
50	Harwood et al. 2011 (Harwood et al., 2011)	<i>Descriptive</i> , study protocol	
51	Goldberg, Bradshaw, et al. 2013 (Goldberg et al., 2013)	<i>Comparative</i> , randomised controlled trial (MPU versus standard care)	n=600 patients
52	Spencer et al. 2013 (Spencer, Foster, Whittamore, Goldberg, & Harwood, 2013)	<i>Comparative</i> , semi structured interviews were conducted with carers of patients with cognitive impairment alongside a randomized controlled trial.	n=40 carers
53	Tanajewski et al. 2015 (Tanajewski et al., 2015)	Comparative, trial-based economic evaluation	n=600 patients
54	Chan et al. 2018	<i>Descriptive</i> , comparison of five MPU models	NA
55	Dekker et al. 2019	<i>Descriptive</i> , chart review	n=258

Table A2-1 – List of excluded papers, with reasons.

#	Reference	Exclusion reason
1	Gray Jr EC: Psychiatric unit offers integrated care. <i>Mod Hosp</i> 88:55-9; passim, 1957	Not on subject
2	Wallace CM: Working on a mixed psychiatric unit. <i>Nurs Mirror Midwives J</i> 128:28, 1969	Full text not retrievable
3	Egede LA: [Medical psychiatric department]. <i>Tidsskr Sygepl</i> 71:363, 1971	Not in English
4	Whitehead T, Mankikar G: Letter: Psychiatric-geriatric joint patient unit. <i>Lancet</i> 1:31-2, 1974	Letter to the editor
5	Lipsei A: Mixed Neurological and Psychiatric-Wards - a New Type of Hospital Wards. <i>Zhurnal Nevropatologii i Psikhiiatrii Imeni S S Korsakova</i> 80:1430-, 1980	Full text not retrievable
6	Nelson WH, Orr Jr WW, Sullivan CR: Use of the dexamethasone suppression test on a combined medicine-psychiatry inpatient unit. <i>Int J Psychiatry Med</i> 12:103-8, 1982	Clinical management overview
7	Strain JJ: Needs for psychiatry in the general hospital. <i>Hosp Community Psychiatry</i> 33:996-1001, 1982	Perspective/letter/editorial
8	Goodman B: The Psych-Med Unit. <i>Psychosomatic Medicine</i> 45:76-7, 1983	Abstract
9	Molnar G, Fava GA: Characteristics of Medical-Psychiatric Unit and Liaison-Consultation Service Patients. <i>Psychosomatic Medicine</i> 45:77-, 1983	Abstract
10	Steuber H, Muller P: Mental illness in internal hospitals: Results of an inquiry. <i>Psychiatr Prax</i> 10:20-3, 1983	Full text not retrievable
11	Brown JT, Harris RT: The medical-psychiatric unit and psychosocial education of internists. <i>Psychosomatics</i> 26:231-3, 7-8, 1985	Not on subject
12	Gardiner GC, Simson S, Nathan RJ: Geropsychiatric Care on a Psych-Med Unit. <i>Gerontologist</i> 25:245-6, 1985	Abstract
13	Koran LM: Medical-psychiatric units and the future of psychiatric practice. <i>Psychosomatics</i> 26:171+5, 1985	Perspective/letter/editorial
14	Fogel BS, Stoudemire A: Organization and development of combined medical-psychiatric units: Part 2. <i>Psychosomatics</i> 27:417-20, 25-8, 1986	Guide on establishing/running
15	Kathol R: New UI Medical Psychiatry Unit serves special patients. <i>Iowa Med</i> 76:217-8, 1986	Little organizational details
16	Stoudemire A, Fogel BS: Organization and development of combined medical-psychiatric units: Part 1. <i>Psychosomatics</i> 27:341-5, 1986	Guide on establishing/running
17	Fava GA: Medical-psychiatric service. <i>Psychother Psychosom</i> 48:96-100, 1987	Literature review
18	Fogel BS, Kroessler D: Treating late-life depression on a medical-psychiatric unit. <i>Hosp Community Psychiatry</i> 38:829-31, 1987	Clinical management overview
19	Stoudemire A, Hales RE, Thomas CR: Medical-psychiatry units: an economic alternative for consultation-liaison psychiatry? <i>Hosp Community Psychiatry</i> 38:815-8, 1987	Perspective/letter/editorial
20	von Rad M, Sellschopp A: The integrated psychosomatic inpatient unit. A new approach to hospital medical care. <i>Psychother Psychosom</i> 48:101-9, 1987	Not on subject
21	Brooks WB, Finestone DH, Jordan JS, et al.: Does a Multidisciplinary Unit Improve Function in Patients with Combined Medical-Psychiatric Problems. <i>Clinical Research</i> 36:A739-A, 1988	Full text not retrievable
22	Stoudemire GA, Fogel BS: The emergence of medical psychiatry: a provocative viewpoint. <i>Psychosomatics</i> 29:207-13, 1988	Perspective/letter/editorial
23	Cowart T, Stoudemire A: Nursing staff development and facility design for medical-psychiatry units. <i>Gen Hosp Psychiatry</i> 11:125-36, 1989	Guide on establishing/running
24	Fogel BS: Med-psych units. Financial viability and quality assurance. <i>Gen Hosp Psychiatry</i> 11:17-22, 1989	Guide on establishing/running

25	Lipowski Z: The interface of psychiatry and medicine: Towards integrated health care. The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie 32:743-8, 1989	Perspective/letter/editorial
26	Young LD: Progress in Combined Psychiatry and Medicine Units - Administrative, Educational, and Clinical Viewpoints - Introduction. General Hospital Psychiatry 11:16-, 1989	Perspective/letter/editorial
27	Brooks WB, Divine GS, Feldman MD, et al.: Efficacy of a Medicine Psychiatry Unit - a Randomized Trial. Clinical Research 38:A737-A, 1990	Abstract
28	Goldberg RJ, Simundson S: Managing Medicare reimbursement on medical-psychiatry units. Gen Hosp Psychiatry 13:313-8, 1991	Guide on establishing/running
29	Harsch HH, Koran LM, Young LD: A profile of academic medical-psychiatric units. Gen Hosp Psychiatry 13:291-5, 1991	Not traceable to individual units
30	Kathol RG: Medicine Psychiatry Units. Clinical Research 39:A627-A, 1991	Abstract
31	Stoudemire A, Hill CD, Morris R, et al.: The medical-psychiatric unit as a site for outcome research in dementia/depression syndromes. Psychiatr Med 9:535-44, 1991	Clinical management overview
32	Averbuch IE, Lichtenberg P: Mixed psychiatric wards [22]. Br Med J 305:479, 1992	Not on subject
33	Hall RC, Kathol RG: Developing a level III/IV medical/psychiatry unit. Establishing a basis, design of the unit, and physician responsibility. Psychosomatics 33:368-75, 1992	Guide on establishing/running
34	Kathol RG, Harsch HH, Hall RC, et al.: Quality assurance in a setting designed to care for patients with combined medical and psychiatric disease. Psychosomatics 33:387-96, 1992	Guide on establishing/running
35	Kathol RG, Harsch HH, Hall RCW, et al.: Categorization of types of medical/psychiatry unit based on level of acuity. Psychosomatics 33:376-86, 1992	Perspective/letter/editorial
36	Dolinar LJ: Obstacles to the care of patients with medical-psychiatric illness on general hospital psychiatry units. Gen Hosp Psychiatry 15:14-20, 1993	Not on subject
37	Gertler R, Blackwell CJ: Medical psychiatric unit. Med J Aust 160:235, 1994	Perspective/letter/editorial
38	Kathol RG: Medical psychiatry units: the wave of the future. Gen Hosp Psychiatry 16:1-3, 1994	Perspective/letter/editorial
39	Katz IR, Striem J, Parmelee P: Psychiatric-medical comorbidity: implications for health services delivery and for research on depression. Biol Psychiatry 36:141-5, 1994	Not on subject
40	Stoudemire A, Hill CD, Dalton ST, et al.: Rehospitalization rates in older depressed adults after antidepressant and electroconvulsive therapy treatment. J Am Geriatr Soc 42:1282-5, 1994	Not on subject
41	Summergrad P: Medical psychiatry units and the roles of the inpatient psychiatric service in the general hospital. Gen Hosp Psychiatry 16:20-31, 1994	Perspective/letter/editorial
42	Carney CP, Yates WR: Characteristics and Outcomes of Eating Disorders - the Role of the Medical Psychiatry Unit. Psychosomatics 36:167-, 1995	Abstract
43	Goldberg RJ, Stoudemire A: The future of consultation-liaison psychiatry and medical-psychiatric units in the era of managed care. Gen Hosp Psychiatry 17:268-77, 1995	Perspective/letter/editorial
44	Kishi Y, Kathol R, Cooney J, et al.: Comparison of Patients with Combined Medical and Psychiatric-Illness Treated on a Type-Iv Medical Psychiatry Unit or a Medicine Unit. Psychosomatics 36:212-3, 1995	Abstract
45	Penalosa B, Meiler A, Rothmeier C, et al.: Treatment of anorectic inpatients on a psychiatric medical unit. Médecine et hygiène 53:926-9, 1995	Full text not retrievable
46	Goldberg RJ, Stoudemire A: Erratum: The future of consultation-liaison psychiatry in medical- psychiatric units in the era of managed care (General Hospital Psychiatry (1995) 17 (268-277)). Gen Hosp Psychiatry 18:209, 1996	Erratum
47	Kishi Y, Cooney J, Kathol R, et al.: Hospital course of patients with combined medical and psychiatric illness on the medical psychiatry unit and the general medicine units. Psychosomatics 37:216-, 1996	Abstract
48	Archinard M: [Taking charge in a general hospital: from liaison psychiatry to medical-psychiatric units]. Rev Med Interne 19 Suppl 3:347S-9S, 1998	Not in English
49	Honig A, Troost J, Kuijpers PM, et al.: Med Psych Units: Proceedings and abstracts of the Triptych Workshop 9 december 1999 Maastricht. Acta Neuropsychiatr 11:141-5, 1999	Abstract
50	Norton JW, Jones R, Quarles E, et al.: A nursing-centered treatment team in inpatient medical psychiatry. J Psychosoc Nurs Ment Health Serv 37:39-41, 1999	Not on subject
51	Kathol R: Integrating medical and psychiatric treatment in an inpatient medical setting - Reply to Dr. Stoudemire. Psychosomatics 41:367-9, 2000	Perspective/letter/editorial
52	Kishi, Kathol, Stoudemire: Erratum: Integrating medical and psychiatric treatment in an inpatient medical setting (Psychosomatics (July-August 2000)). Psychosomatics 41:x, 2000	Erratum
53	Stoudemire A: Integrating medical and psychiatric treatment in an inpatient medical setting. Psychosomatics 41:366-7, 2000	Perspective/letter/editorial
54	Tan M: Roles and functions of psychiatry medical staff in two services. Australian and New Zealand Journal of Psychiatry 34:A66-A, 2000	Not on subject
55	Anfinson TJ, Bona JR: A health services perspective on delivery of psychiatric services in primary care including internal medicine. Med Clin North Am 85:597-616, 2001	Not on subject
56	Gray GE: Integrated medical care in a mental health clinic improved quality of care and outcomes in serious mental disorders. Evid Based Ment Health 5:46, 2002	Not on subject
57	Marra D, Allilaire JF, Piette JC: Medical-psychiatric unit, a concept to be developed. Rev Med Interne 24:279-81, 2003	Not in English
58	Hauser W, Zimmer C, Klar Y, et al.: [Cost effectiveness of integrated internal medicine]. Psychother Psychosom Med Psychol 54:34-8, 2004	Not in English
59	van Waarde JA, Richter C, Muller ME, et al.: [The medical-psychiatric unit: added value for patients, physicians and hospitals]. Ned Tijdschr Geneesk 148:209-11, 2004	Not in English
60	Regan J, Prince T, Wilhoite K, et al.: Integrating medicine and psychiatry: Psychiatric Medical Units (PMUs). Tenn Med 98:448-9, 2005	Subject is MPU that has yet to be established
61	Fennig S, Fennig S: Can we treat morbid obese children in a behavioral inpatient program? Pediatr Endocrinol Rev 3:590-6, 2006	Full text not retrievable
62	Leue C, Driessen G, Strik JJ, et al.: Managing complex patients on a medical psychiatric unit: a comprehensive but medical consumption reducing approach - a record linkage study. Journal of Psychosomatic Research 60:661-, 2006	Abstract
63	Heller HM, Boenink AD: The Medical Psychiatric Unit in the Free University medical centre, Amsterdam, the Netherlands: Living together and not apart. Journal of Psychosomatic Research 63:321-, 2007	Abstract

64	Passov V, Rundell JR: Analysis of transfers from a medical-psychiatry inpatient unit to a medical-surgical unit within 48 hours of admission. <i>Psychosomatics</i> 49:535-7, 2008	Little organizational details
65	Saarela TM, Finne-Soveri H, Liedepohja AM, et al.: Comparing psychogeriatric units to ordinary long-term care units - Are there differences in case-mix or clinical symptoms? <i>Nord J Psychiatry</i> 62:32-8, 2008	Not on subject
66	Tuerlings JHAM, Muller METM, Verwey B, et al.: Palliative care in a psychiatric-somatic care unit. <i>Ned Tijdschr Geneesk</i> 152:1949-52, 2008	Not in English
67	Prada P, Aspinall V, Alberque C, et al.: [A combined medical-psychiatric unit for the management of complex cases]. <i>Rev Med Suisse</i> 5:366-9, 2009	Full text not retrievable
68	Jagt YQ, Knottnerus AC, Cohen A, et al.: The psy-med unit (PMU); A unique and integrated approach for children with invalidating functional abdominal pain (FAP)! <i>J Pediatr Gastroenterol Nutr</i> 50:E118-E9, 2010	Abstract
69	Kathol RG: Cost outcomes on a medical psychiatry unit. <i>J Psychosom Res</i> 68:293-4, 2010	Perspective/letter/editorial
70	Knottnerus AC, Jagt YQ, Kohnhorst E, et al.: The PSY-MED Unit (PMU); a unique integrated approach for children with invalidating therapy resistant functional complaints! <i>Eur Psychiatry</i> 25, 2010	Abstract
71	Madaras A, Hilton C: Developing an intermediate care unit for older people with mental and physical illnesses. <i>Nurs Times</i> 106:18-9, 2010	Not on subject
72	Denes D, Gohier B, Richard-Devantoy S, et al.: [Medical-psychiatric units: shared care in mental health]. <i>Sante Publique</i> 23 Suppl 6:S167-74, 2011	Not in English
73	George J, Adamson J, Woodford H: Joint geriatric and psychiatric wards: a review of the literature. <i>Age Ageing</i> 40:543-8, 2011	Literature review
74	Knottnerus A, Jagt Y, Cohen A, et al.: Short term and long term effects of the psy-med unit (pmu); A unique integrated approach for children with invalidating functional complaints. <i>J Psychosom Res</i> 70:600-1, 2011	Abstract
75	Fowler J, Paulsen J, Liu D, et al.: Implementation of a symptom-triggered benzodiazepine protocol for alcohol withdrawal on a combined internal medicine-psychiatry unit. <i>J Pharm Pract</i> 25:284, 2012	Clinical management overview
76	Goldberg SE, Whittamore KH, Harwood RH, et al.: Cognitively Impaired Older Patients' Experiences of Care on a Medical and Mental Health Unit Compared to Standard Care Wards in a General Hospital: A Controlled Clinical Trial. <i>Age and Ageing</i> 42:29-, 2013	Abstract
77	Hilton C, Madaras A, Qureshi M: An intermediate care unit for older people with both physical and psychiatric disorders: Naturalistic outcome study. <i>Int Psychogeriatr</i> 25:895-900, 2013	Historical study
78	Ong T, Harwood R: Does a Specialist Medical and Mental Health Unit (Mmhu) Improve Outcomes Compared with Standard Care for Confused Older People Admitted as an Emergency: A Service Evaluation Alongside a Controlled Clinical Trial. <i>Age and Ageing</i> 42:15-, 2013	Abstract
79	Hilton C: Joint geriatric and old-age psychiatric wards in the UK, 1940s-early 1990s: A historical study. <i>Int J Geriatr Psychiatry</i> , 2014	Not on subject
80	Honig A, Visser I, Heller H, et al.: [A medical-psychiatric unit in a general hospital: effective combined somatic and psychiatric care?]. <i>Ned Tijdschr Geneesk</i> 158:A6520, 2014	Not in English
81	Hussain M, Seitz D: Integrated models of care for medical inpatients with psychiatric disorders: a systematic review. <i>Psychosomatics</i> 55:315-25, 2014	Literature review
82	Yokoi Y, Misal M, Oh E, et al.: Benzodiazepine discontinuation and patient outcome in a chronic geriatric medical/psychiatric unit: a retrospective chart review. <i>Geriatr Gerontol Int</i> 14:388-94, 2014	Clinical management overview
83	van Schijndel MA, Jansen LAW, Caarls PJ, et al.: [Medical Psychiatric Units in the Netherlands: an investigation into distribution and quality] Dutch. <i>Ned Tijdschr Geneesk</i> 161:D890, 2017	Not traceable to individual units
84	Duffy R, Sadlier M, van der Ploeg AH, et al.: The case for shared medical and psychiatric units: Are they needed and how they could run? <i>Ir Med J</i> 111, 2018	Perspective/letter/editorial
85	Fujimoto M, Yoshino E, Kamada Y, et al.: Management of psychiatric medical unit with tuberculosis merger in NHO Yamato mental-medical center. <i>IRYO - Japanese Journal of National Medical Services</i> 72:317-20, 2018	Full text not retrievable
86	Caarls PJ, van Schijndel MA, Kromkamp M, et al.: Need analysis for a new high acuity medical psychiatry unit: which patients are considered for admission? <i>BMC Health Serv Res</i> 19:139, 2019	MPU has yet to be established
87	Van Schijndel MA, Jansen LAW, Van De Klundert JJ: Empirical types of medical psychiatry units. <i>Psychother Psychosom</i> 88:127-8, 2019	Not traceable to individual units

References

- Alberque, C., Gex-Fabry, M., Whitaker-Clinch, B., & Eytan, A. (2009). The five-year evolution of a mixed psychiatric and somatic care unit: a European experience. *Psychosomatics*, 50(4), 354-361. doi:10.1176/appi.psy.50.4.354
- Arie, T., & Dunn, T. (1973). A 'do it yourself' psychiatric geriatric joint patient unit. *Lancet*, 2(7841), 1313-1316.
- Astell, A. J., Clark, S. A., & Hartley, N. T. (2008). Predictors of discharge destination for 234 patients admitted to a combined geriatric medicine/old age psychiatry unit. *Int J Geriatr Psychiatry*, 23(9), 903-908. doi:10.1002/gps.2002
- Bruns, W., & Stoudemire, A. (1990). Development of a medical-psychiatric program within the private sector. Potential problems and strategies for their resolution. *Gen Hosp Psychiatry*, 12(3), 137-147.
- Buckley, P., Freyne, A., & Walshe, N. (1994). The medical-psychiatry unit: A pilot study of conjoint care within an Irish general hospital. *Psychosomatics*, 35(6), 515-519.
- Campo, J. V., & Raney, D. (1995). The pediatric medical-psychiatric unit in a psychiatric hospital. *Psychosomatics*, 36(5), 438-444. doi:10.1016/S0033-3182(95)71624-3
- Chang, C. M., Lee, Y., Lee, Y., Yang, M. J., & Wen, J. K. (2001). Predictors of readmission to a medical-psychiatric unit among patients with minor mental disorders. *Chang Gung Med J*, 24(1), 34-43.

- Eytan, A., Bovet, L., Gex-Fabry, M., Alberque, C., & Ferrero, F. (2004). Patients' satisfaction with hospitalization in a mixed psychiatric and somatic care unit. *Eur Psychiatry, 19*(8), 499-501. doi:10.1016/j.eurpsy.2004.09.004
- Farragher, B., & Walsh, N. (1998). Joint care admissions to a psychiatric unit: a prospective analysis. *Gen Hosp Psychiatry, 20*(2), 73-77.
- Fava, G. A., Wise, T. N., Molnar, G., & Zielezny, M. (1985). The medical-psychiatric unit: a novel psychosomatic approach. *Psychother Psychosom, 43*(4), 194-201. doi:10.1159/000287879
- Fennig, S., & Fennig, S. (1999). Diagnostic delays and dilemmas: Management of affected patients in the psychiatric inpatient unit of a general children's hospital. *General hospital psychiatry, 21*(2), 122-127.
- Fennig, S., & Fennig, S. (1999). Management of encopresis in early adolescence in a medical-psychiatric unit. *Gen Hosp Psychiatry, 21*(5), 360-367.
- Fennig, S., Fennig, S., & Roe, D. (2002). Physical recovery in anorexia nervosa: Is this the sole purpose of a child and adolescent medical-psychiatric unit? *Gen Hosp Psychiatry, 24*(2), 87-92.
- Fogel, B. S. (1985). A psychiatric unit becomes a psychiatric-medical unit: administrative and clinical implications. *Gen Hosp Psychiatry, 7*(1), 26-35.
- Fogel, B. S., Stoudemire, A., & Houpt, J. L. (1985). Contrasting models for combined medical and psychiatric inpatient treatment. *Am J Psychiatry, 142*(9), 1085-1089. doi:10.1176/ajp.142.9.1085
- Freeberg, S., Kiner, D., & Walker, B. (1976). Nursing care in a combined adolescent medical-psychiatric unit. *J Psychiatr Nurs Ment Health Serv, 14*(11), 13-15.
- Gertler, R., Kopec-Schrader, E. M., & Blackwell, C. J. (1995). Evolution and evaluation of a medical psychiatric unit. *Gen Hosp Psychiatry, 17*(1), 26-31.
- Goldberg, S. E., Bradshaw, L. E., Kearney, F. C., Russell, C., Whittamore, K. H., Foster, P. E., . . . Medical Crises in Older People Study, G. (2013). Care in specialist medical and mental health unit compared with standard care for older people with cognitive impairment admitted to general hospital: randomised controlled trial (NIHR TEAM trial). *BMJ, 347*(7917), f4132. doi:10.1136/bmj.f4132
- Goodman, B. (1985). Combined psychiatric-medical inpatient units: the Mount Sinai model. *Psychosomatics, 26*(3), 179-182, 185-176, 189. doi:10.1016/S0033-3182(85)72873-3
- Hanna, S. J., Woolley, R., Brown, L., & Kesavan, S. (2008). The coming of age of a joint elderly medicine-psychiatric ward: 18 years' experience. *Int J Clin Pract, 62*(1), 148-151. doi:10.1111/j.1742-1241.2007.01504.x
- Harsch, H. H., LeCann, A. F., & Ciaccio, S. (1989). Treatment in combined medical psychiatry units: an integrative model. *Psychosomatics, 30*(3), 312-317. doi:10.1016/S0033-3182(89)72278-7
- Harwood, R. H., Goldberg, S. E., Whittamore, K. H., Russell, C., Gladman, J. R. F., Jones, R. G., . . . Elliot, R. A. (2011). Evaluation of a Medical and Mental Health Unit compared with standard care for older people whose emergency admission to an acute general hospital is complicated by concurrent 'confusion': A controlled clinical trial. Acronym: TEAM: Trial of an Elderly Acute care Medical and mental health unit. *Trials, 12*.
- Hoffman, R. S. (1984). Operation of a medical-psychiatric unit in a general hospital setting. *Gen Hosp Psychiatry, 6*(2), 93-99.
- Kahan, B. B., & Sexson, S. B. (1991). Organization and development of pediatric medical-psychiatric units. Part II: Clinical management issues. *Gen Hosp Psychiatry, 13*(6), 391-398.
- Kathol, R. G., Krummel, S., & Shakespeare, A. (1989). Psychiatry and internal medicine resident education in an acute care medical-psychiatry unit. *Gen Hosp Psychiatry, 11*(1), 23-30.
- Kiernan, K., & Stoudemire, A. (1989). Occupational therapy program development for medical-psychiatry units: a cognitive model. *Gen Hosp Psychiatry, 11*(2), 109-118.
- Kishi, Y., & Kathol, R. G. (1999). Integrating medical and psychiatric treatment in an inpatient medical setting. The type IV program. *Psychosomatics, 40*(4), 345-355. doi:10.1016/S0033-3182(99)71230-2
- Koran, L. M., & Barnes, L. E. A. (1982). The stanford comprehensive medicine unit: Integrating psychiatric and medical care. *New Directions for Mental Health Services, 1982*(15), 61-73. doi:10.1002/ym.23319821507

- Leue, C., Driessen, G., Strik, J. J., & Drukker, M. (2010). Managing complex patients on a medical psychiatric unit: an observational study of university hospital costs associated with medical service use, length of stay, and *Journal of Psychosomatic Research*.
- Maier, A. B., Wachtler, C., & Hofmann, W. (2007). Combined medical-psychiatric inpatient units: evaluation of the Centre for the Elderly. *Z Gerontol Geriatr*, 40(4), 268-274. doi:10.1007/s00391-007-0432-8
- Markoff, R. A., Yano, B. S., Hsu, J., & Wright, D. H. (1981). The mixed medical-psychiatric unit: an alternative approach to inpatient psychiatric care. *Hosp Community Psychiatry*, 32(8), 561-564.
- Molnar, G., Fava, G. A., & Zielezny, M. A. (1985). Medical-psychiatric unit patients compared with patients in two other services. *Psychosomatics*, 26(3), 193-195, 199-200, 208-199. doi:10.1016/S0033-3182(85)72874-5
- Morgan, D. M., & Withersty, D. J. (1981). Patient acceptance of an integrated psychiatric/medical unit. *W V Med J*, 77(5), 114-115.
- Moss, G. R., & James, C. R. (1986). Pilot study of a behavioral medicine program in a community hospital setting. *J Behav Ther Exp Psychiatry*, 17(1), 3-9.
- Muqtadir, S., Hamann, M. W., & Molnar, G. (1986). Management of psychotic pregnant patients in a medical-psychiatric unit. *Psychosomatics*, 27(1), 31-33. doi:10.1016/S0033-3182(86)72740-0
- Nomura, S., Shigemura, J., Nakamura, M., Hosaka, T., Berger, D., & Takahashi, Y. (1996). Evaluation of the first Medical Psychiatry Unit in Japan. *Psychiatry Clin Neurosci*, 50(6), 305-308.
- Pitt, B., & Silver, C. P. (1980). The combined approach to geriatrics and psychiatry: evaluation of a joint unit in a teaching hospital district. *Age Ageing*, 9(1), 33-37.
- Porello, P. T., Madsen, L., Futterman, A., & Moak, G. S. (1995). Description of a geriatric medical/psychiatry unit in a small community general hospital. *J Ment Health Adm*, 22(1), 38-48.
- Protheroe, D., & House, A. (1999). In-patient liaison psychiatry in the UK: A neglected option for improving the psychiatric care of medical patients. *Psychiatric Bulletin*, 23(9), 525-527.
- Raney, D., & Siegel, C. H. (1994). An adolescent psychiatric unit for difficult medical patients. *Child Psychiatry Hum Dev*, 25(2), 109-124.
- Sexson, S. B., & Kahan, B. B. (1991). Organization and development of pediatric medical-psychiatric units. Part I: Administrative, financial, and political issues. *Gen Hosp Psychiatry*, 13(5), 296-304.
- Shemo, J. P., Ballenger, J. C., Yazel, J. J., & Spradlin, W. W. (1982). A conjoint psychiatry-internal medicine program: development of a teaching and clinical model. *Am J Psychiatry*, 139(11), 1437-1442. doi:10.1176/ajp.139.11.1437
- Spencer, K., Foster, P., Whittamore, K. H., Goldberg, S. E., & Harwood, R. H. (2013). Delivering dementia care differently-evaluating the differences and similarities between a specialist medical and mental health unit and standard acute care wards: A qualitative study of family carers' perceptions of quality of care. *BMJ Open*, 3(12).
- Stoudemire, A., Brown, J. T., McLeod, M., Stewart, B., & Houpt, J. L. (1983). The combined medical specialties unit: an innovative approach to patient care. *N C Med J*, 44(6), 365-367.
- Stoudemire, A., Hill, C. D., Morris, R., & Markwalter, H. (1991). The medical-psychiatric unit as a site for outcome research in dementia/depression syndromes. [JvW+MvS: alleen onderzoek depressie/dementie, nauwelijks over MPU]. *Psychiatr Med*, 9(4), 535-544.
- Stoudemire, A., Kahn, M., Brown, J. T., Linfors, E., & Houpt, J. L. (1985). Masked depression in a combined medical-psychiatric unit. *Psychosomatics*, 26(3), 221-224, 227-228. doi:10.1016/S0033-3182(85)72875-7
- Swenson, J. R., & Mai, F. M. (1992). A Canadian medical-psychiatric inpatient service. *Can J Psychiatry*, 37(5), 326-334.
- Tanajewski, L., Franklin, M., Gkoutouras, G., Berdunov, V., Harwood, R. H., Goldberg, S. E., . . . Elliott, R. A. (2015). Economic Evaluation of a General Hospital Unit for Older People with Delirium and Dementia (TEAM Randomised Controlled Trial). *PloS one*, 10(12), e0140662. doi:10.1371/journal.pone.0140662
- Trappler, B., Greenberg, S., & Friedman, S. (1995). Treatment of Hassidic Jewish patients in a general hospital medical-psychiatric unit. *Psychiatr Serv*, 46(8), 833-835. doi:10.1176/ps.46.8.833

- White, E. M. (1988). The use of a medical support group on a medical/psychiatric unit. *Issues Ment Health Nurs*, 9(4), 353-362.
- Withersty, D. J., Shemo, J. P., Waldman, R. H., & Stevenson, J. M. (1980). Evaluating a conjoint psychiatric-medical inpatient unit—a one year follow-up study of depressed patients. *J Clin Psychiatry*, 41(5), 156-158.
- Young, L. D., & Harsch, H. H. (1986). Inpatient unit for combined physical and psychiatric disorders. *Psychosomatics*, 27(1), 53-60. doi:10.1016/S0033-3182(86)72742-4
- Young, L. D., & Harsch, H. H. (1989). Length of stay on a psychiatry-medicine unit. *Gen Hosp Psychiatry*, 11(1), 31-35.

Appendix 3a: Aims of MPUs

#	Aim	Number of MPUs that mention aim	References
1	Diagnose and treat patients with concomitant medical and psychiatric disorders	26	(11-13, 15, 23, 26, 29, 31, 33-39, 46, 47, 49, 51, 54, 57, 59-63, 65-67, 70, 71, 73-75)
2	Promote integration, decompartmentalization, and continuity of care	14	(12, 13, 15, 29, 33, 34, 37, 38, 47, 58, 60-62, 65, 67, 68, 72)
3	Improve quality and safety	13	(12, 13, 23, 34, 54, 59, 60, 71, 73-75)
4	Improve patient-related and health economic outcomes	11	(12, 13, 23, 43, 44, 52, 53, 60, 61, 69, 71, 76)
5	Train residents and medical students	10	(30-32, 34, 35, 39, 40, 59, 64, 68-70, 73-75)
6	Manage “problem patients” showing disruptive behavior or high healthcare utilization	9	(11, 15, 23, 33, 34, 36, 38, 41, 43-45, 61, 62, 65, 66, 70)
7	Address the high co-occurrence of medical and psychiatric illness	8	(15, 33, 38, 42, 48, 57, 60, 62)
8	Answer unmet healthcare needs	5	(15, 23, 46, 51, 61, 65)
9	Increase patient acceptance and decrease stigma by treatment in medical setting	3	(12, 13, 42, 50)
10	Research	3	(31, 41, 45, 68)

Appendix 3b: Structural and procedural characteristics of MPUs. MPUs are ordered in accordance with their chronological appearance in the literature. CA = children and adolescent units, AE = adult and elderly units, E = elderly units.

#	MPU NAME	STRUCTURE	PROCESS
CA1	Teen-age medical unit at Akron Children's hospital, Akron, Ohio, USA (Freeberg et al., 1976)	<p>Hospital type and size Children's hospital, size NR*</p> <p>Unit size and embedding 19 beds on medical unit</p> <p>Ward features Lockable ward, one private room convertible to seclusion room, all other rooms are three-bed units (one can be locked)</p> <p>Medical staff Pediatrician (A) + part time psychiatrist (C) + private attendings + residents</p> <p>Nursing staff Pediatric nursing staff with psychiatric training through staff meetings and medical training through staff development program, psychiatric nurse clinician</p> <p>Other staff Psychologists, social worker</p>	<p>Referral Referral NR*</p> <p>Age: "adolescence"</p> <p>Population Psychosomatic illnesses, hysterical and conversion reactions, anorexia Medical Dx NR*</p> <p>Collaboration Primary nursing care model (nurse continuity)</p> <p>Treatment Compulsory admission NR*. Nonsegregated treatment. Peer like-community</p> <p>LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
CA2	Pediatric medical-psychiatric service at Egleston Children's Hospital at Emory, Atlanta, USA (Kahan & Sexson, 1991; Sexson & Kahan, 1991)	<p>Hospital type and size University-affiliated, tertiary-care pediatric hospital, 165-beds</p> <p>Unit size and embedding 8 beds located in the Children's hospital.</p> <p>Ward features Unlocked, but closed door. Facilities: not clear which recommendations have actually been implemented</p> <p>Medical staff Child Psychiatrist (MD, A) + attending pediatrician + subspecialty consultation + child psychiatry residents + pediatric residents</p> <p>Nursing staff RN psychiatry nursing staff, psychiatry clinical nurse specialist, in-service training, rotation to medical floors</p> <p>Other staff Mental health assistants, psychologist, social worker (also family therapist), education therapist, expressive and activities therapists, dietician and clinical psychologist on request.</p>	<p>Referral Pediatricians or pediatric subspecialists (97%), mental health professionals (16%), and self-referrals (5%).</p> <p>Age Ranges from 4-18 years</p> <p>Population Patients who present with psychosomatic disorders or combined psychiatric and medical problems and who maintain a level of functioning that does not require physical management of problematic behavior. The range of psychiatric diagnoses was wide. The range of medical conditions is extremely broad, with the majority of conditions being seen only once. Psychological factors affecting physical condition (18.4%), somatoform disorder including conversion (14.4%), eating disorder (10%), ADHD (9.6%). Medical Dx: diabetes mellitus (12.1%), severe obesity (6.6%), renal disease/transplant (6.6%), abdominal pain (6.1%), starvation stat (5.6%).</p> <p>Collaboration Medical director (CP) is admission gatekeeper and attending physician to all cases. Pediatric house staff regularly visit all MPU patients on rounds.</p> <p>Treatment Open psychosomatic model. Compulsory admission: no. Process-oriented milieu. Combination of individualized and milieu interventions. Individual psychotherapy. Group psychotherapy. Psychopharmacology. Milieu interventions: regular and predictable daily schedules, daily community meeting, nightly wrap-up group, expressive therapy activities groups and a school program. A privilege level system emphasizing patient-identified goals and objectives. Individualized behavioral contracting is often useful in facilitating medical compliance or reduction in inappropriate behaviors. Health education. Continuity of therapy between the inpatient and outpatient setting is essential. Family involvement+</p> <p>LOS Mean LOS 27 days, range 1-124 days.</p> <p>Funding Child psychiatrist bills at reasonable attending rates commensurate with service delivered. Pediatric attending consultants bill as medical consultants. Room charges should be set to reflect the daily cost for providing milieu-based services. In our setting we were initially able, with negotiation, to offer services to patients with combined medical and psychiatric diagnoses without psychiatric licensure. Under this plan it was also necessary for us to comply only with the medical standards of JCAH. However, with expansion of services to include some traditional psychiatric patients, psychiatric licensure may become imperative.</p>

			<p>Aftercare Almost all patients were discharged directly home.</p>
CA3	<p>Adolescent Medical/Psychiatric Unit at Children's Hospital, Denver, USA (Raney & Siegel, 1994)</p>	<p>Hospital type and size Pediatric tertiary care hospital, size NR*</p> <p>Unit size and embedding 16 beds, physically contiguous to the medical units in the main hospital.</p> <p>Ward features Locked unit. Full range of both medical and psychiatric services. Physical layout compatible with both a psychiatric milieu and medical care. Some beds with wheelchair accessible bathrooms.</p> <p>Medical staff Child psychiatrist (MD, A). Adolescent medicine specialist (associate MD).</p> <p>Nursing staff Psychiatrically and medically trained nurses, nursing director is a psychiatrically trained administrative nurse. Two nursing leaders have the responsibility for maintaining the quality of medical care on the unit.</p> <p>Other staff NR*</p>	<p>Referral Psychiatrist (16%), general pediatrician (15%), social services/worker (11%), psychologist (10%), group home (10%), adolescent medicine (9%), consult service (7%), other medical hospital (6%), surgery (6%), other psychiatric hospital (6%). Oncology (5%), other (17%).</p> <p>Age Age range from 15-22 years.</p> <p>Population Approximately 40% of the patients treated on the unit during the first four years have had significant medical problems. As reported in the literature on adults, the nature and complexity of the medical problems has steadily increased with the increased collaborative skills between the psychiatrists and medical co-practitioners, as well as the increased nursing comfort and skill level with these difficult patients. Medical patients with unclear diagnosis, very difficult behavior or severe non-compliance. Broad variety of medical diagnoses. The most common medical diagnoses have been diabetes, eating disorders, asthma, and neurologic disorders. Psychiatric Dx NR*</p> <p>Collaboration Difficult medical/ psychiatric patients are screened prior to admission with review by the Nursing Director and the nurses in charge of medical quality. If problems are identified by this group, there is subsequent consultation with the Medical Director. Each patient has a psychiatrist who is responsible for psychiatric assessment and treatment in coordination with the milieu team. The psychiatrist also has the overall organizing responsibility for the case. An adolescent medicine specialist is involved in each case for management of medical problems and coordination of subspecialty involvement in collaboration with the psychiatrist. Weekly staffings in difficult cases. Collaboration between a number of disciplines, including both medical and psychiatric practitioners, from the beginning. In addition to ongoing medical management, there is the availability of 24-hour emergency medical coverage by the faculty of the Adolescent Medicine Department. There also is a twice a week on-unit medical clinic for minor problems. Ongoing collaboration between psychiatrically trained and medically trained nurses also occurs in each case, and there is frequent involvement of nurse clinical specialists from the appropriate subspecialty.</p> <p>Treatment Compulsory admission NR* intravenous medications, dialysis, oxygen, and cardiac monitors (for rate only). Holistic, integrating approach with both medical and psychotherapeutic elements.</p> <p>LOS LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
CA4	<p>Center for Pediatric Psychiatry and Medicine Inpatient Unit, Western Psychiatric Institute and Clinic in Pittsburgh, USA (Campo & Raney, 1995)</p>	<p>Hospital type and size (at the time of the unit's development and over its first several years of operation) Free-standing psychiatric hospital academically affiliated with the University of Pittsburgh (Presbyterian University Hospital). The hospital is located within one block of the Children's Hospital of Pittsburgh (CHP).</p> <p>Unit size and embedding 9 beds, embedding NR*</p> <p>Ward features Locked ward, seclusion room. Three single rooms and three double rooms. Wheelchair accessible. Medical treatment room that contains an examination table, diagnostic equipment, an emergency cart, a defibrillator, and other emergency medical supplies, including equipment and supplies for blood drawing and intravenous therapy. Wall oxygen and suction in treatment room and selected patient rooms, where a special wall bracket prevents inappropriate use by patients. Clean and dirty utility rooms. The nurses' station is enclosed in safety glass. A multi-purpose conference room is available for staff</p>	<p>Referral These patients were usually admitted through the emergency room when other child and adolescent inpatient beds are unavailable.</p> <p>Age Age range 5-18 (preschoolers as young as 3 and a few older patients may be admitted when judged appropriate by the unit leadership)</p> <p>Population Mixed patient population, with the majority having a concomitant medical condition associated with their psychiatric illness, and sometimes underlying it. Over 60% of patients admitted had a concomitant chronic medical illness, while 10% to 15% were admitted with medically unexplained physical symptoms or somatization. The remainder of the patients admitted and treated on the unit were typical psychiatric patients without a specific physical condition.</p> <p>Both internalizing and externalizing disorders are treated routinely, as are patients on involuntary commitment. Psychiatric Dx NR* wide variety of "medical" conditions, including seizure disorders, diabetes, asthma, head injury, eating disorders, spina bifida, failure to thrive, post organ transplant, and somatoform disorders. patients with a neurologically based illness, such as epilepsy, are among the most commonly served patients on the unit. Diabetes mellitus and other endocrine disorders are also common medical conditions treated.</p> <p>Collaboration Pediatric medical assessment and treatment on the unit are coordinated by the unit's halftime pediatrician. Pediatric subspecialty consultation is available through the CHP, though the availability of a highly skilled pediatrician on the inpatient unit serves to reduce the need for excessive face-to-face consultation time for outside consultants. For example, the specifics of a given diabetic patient's care may be discussed in detail with the pediatric endocrinologist at CHP but implemented by the pediatrician. A half-time pediatric nurse practitioner works closely with the pediatrician and with nursing staff. Medical issues that develop outside the usual working</p>

		<p>meetings and conferences, patient groups, and large family meetings. Patients routinely take their meals in the hospital cafeteria, but meals can be provided for selected patients on the unit when necessary, such as during the initial evaluation or when the patient's medical or psychiatric condition prevents using the cafeteria.</p> <p>Medical staff Psychiatrist (MD, A) + half-time pediatrician (A?) + subspecialty consultation through CHP + specialty residents</p> <p>Nursing staff RN and milieu therapist/mental health workers, psychiatric nursing team, nurse practitioner, continuing education and in-service training (both medical and psychiatric issues) and back-up from CHP and Presbyterian on new procedures</p> <p>Other staff Social workers, developmental specialist</p>	<p>day or on weekends are addressed, depending on clinical need and acuity, either by the psychiatric resident on-call, the pediatric telephone back-up, or directly by the on-call pediatrician.</p> <p>The program is organized to foster structured communication between various team members, with an emphasis on integrating the medical and psychiatric understanding of the patient. Team meetings are attended by all relevant disciplines, including pediatricians. Social workers coordinate intake and dispositional arrangements. Liaison with schools and the inpatient school program are coordinated by the unit's developmental specialist, who is trained in meeting the educational needs of psychiatrically troubled children and adolescents.</p> <p>Treatment Compulsory admission possible. Treatment plans are individualized for each case in response to developmental, psychiatric, and pediatric issues. The milieu allows for a full array of psychiatric diagnostic services and interventions to be implemented: complex behavior plans, intensive individual psychotherapy, intensive family work, and a multitude of group psychotherapy experiences. Medical services provided on the unit have included intravenous therapy, bowel and bladder care, ostomy care, diabetes care, care of central lines, and peritoneal dialysis.</p> <p>LOS LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
CA5	<p>Medical-Psychiatric Unit, Schneider Children's Medical Center, Israel (S Fennig & S Fennig, 1999; S. Fennig & S. Fennig, 1999; Fennig et al., 2002)</p>	<p>Hospital type and size Tertiary Children's hospital, size NR*</p> <p>Unit size and embedding 9 beds, embedding NR*</p> <p>Ward features Facilities NR*</p> <p>Medical staff Child and adolescent psychiatrists (A) backed by the pediatric services of the hospital.</p> <p>Nursing staff Psychiatric nursing staff</p> <p>Other staff Child and adolescent psychologists, dieticians, teachers, social workers, art and dance therapists, third-year psychology students for social guidance</p>	<p>Referral From consultation and outpatient pediatric services nationwide.</p> <p>Age Ages range 8-18</p> <p>Population Combinations of somatic and psychological pathologies (e.g., eating disorders, diabetes with depression, somatization disorder, conversion disorder, and failure to thrive of unknown etiology). Usually medically stable patients with acute psychiatric symptoms. Case examples: cyclic vomiting syndrome, conversion disorder. Common denominator: chronic course of somatic symptoms with social and academic impairment, expensive and exhaustive diagnostic workups in several medical centers, burnout and hostility among family, the patient, and the physicians, and late referral to psychiatry. Psychiatric and medical Dx NR*</p> <p>Collaboration NR*</p> <p>Treatment Compulsory admission NR* Safe environment within Children's hospital: medical facility was important to families that were still concerned about their child's medical status. Treatment protocols for diagnostic delays and dilemma's, encopresis (chronic encopretic patients who do not respond to standard treatment) and anorexia nervosa. Complete medical work-up. Early implementation of psychosocial intervention coordinated by a single medical team with a clear message to the family and patient can in most cases prevent further complications. Guided by a coherent psychodynamic understanding the behavior-cognitive frame of reference, though medical intervention remained an integral part of the treatment plan. Supportive, understanding atmosphere must be combined with a clear and highly structured system of rules, levels of functioning and other classical behavioral elements. The family and patient received the explicit message that we were there to help them regain a normal life. We treated the overt behavior with behavioral, medical, and pharmacological measures, with a deemphasis on diagnosis. No miraculous cure was promised; rather, improvement was defined by concrete measures of functioning. The unit was flexible and ready for change. Our unit usually manages medically stable patients with acute psychiatric symptomatology. De-emphasis on diagnosis. Individual and group psychotherapy. Psycho-education. Family involvement. Continuity of care by integrating community team involvement.</p> <p>LOS LOS mostly <8 weeks</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE1	<p>Integrated Psychiatric/Medical Unit at West Virginia University</p>	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 32 beds on former psychiatric ward, now internal medicine service</p>	<p>Referral NR*</p> <p>Age Mean 44.24 years, range 16-63.</p> <p>Population</p>

	<p>Medical Center, Morgantown, USA (Morgan & Withersty, 1981; Shemo et al., 1982; Withersty et al., 1980)</p>	<p>Ward features NR* Medical staff Psychiatrist (MD, A) + rotating general internists (A) + rotating first year med and psych residents, double board residency program. Nursing staff RN medical nurses trained in psychiatry by medical director and psychiatric clinical nursing coordinator Other staff Students. Behavioral medicine consultant. Social workers.</p>	<p>Voluntary admitted and ambulatory patients. A typical patient population had approximately one-third primary medical problems and two-thirds “traditional” psychiatric or psychosomatic problems. Situational disorders, depression, psychosis, and organic brain syndromes; psychiatric problems only in 69.7% Hypertension, diabetes, fevers, pain syndromes, weight loss, and pulmonary infiltrates. Collaboration Collaborative medical management. Four times a week the treatment team—students, nurses, house staff, social workers, medical attending physicians, and psychiatric consultants met to examine the interaction patterns of the team members. Treatment Non-segregated treatment. Milieu therapy and educational approach to psychotherapy, group therapy, crisis-intervention principles. Comprehensive biomedical-emotional-interpersonal evaluation. Psychotropics/TCA and ECT. Family involvement. LOS LOS mean 9.4 days Funding NR* Aftercare NR*</p>
AE2	<p>Mixed medical-psychiatric unit at St. Francis Hospital, Honolulu, USA (Markoff et al., 1981)</p>	<p>Hospital type and size Nonproprietary general hospital, 256 beds Unit size and embedding <1973 no inpatient service, newly developed. 10 psychiatric beds, part of 25 medical beds opening to hospital corridor Ward features Open, group of private and semiprivate rooms (two-, three-, and four-bed rooms), one room convertible to seclusion room. No other facilities for special control or surveillance. Medical environment. Medical staff Psychiatrist (A) + medical residents Nursing staff Medical nursing staff. Cross training/in-service program in psychiatry led by psychiatrist and nurse clinical specialist. To work on the mixed unit, a nurse must develop a dual professional identity and must be ready to carry out both medical-surgical and psychiatric nursing care. While medical-surgical nurses have been willing to acquire psychiatric skills and carry out psychiatric interventions, psychiatric nurses have been less willing to do medical-surgical nursing. Other staff Occupational and recreational therapists, psychologist on request</p>	<p>Referral NR* Age NR* Population Excludes any patient deemed to be actively dangerous to others and limits the admission of actively suicidal patients to one on the unit. Not ideal for patients hospitalized involuntarily and likely to elope. But the risk of elopement, unless combined with dangerousness to self or others, is only a relative contraindication to admission. Within these limitations, any patient, irrespective of diagnosis or extent of abnormality, can be admitted. Usually about one-third of the maximum of ten psychiatric beds are occupied. Full range of psychiatric problems. Affective psychosis 15.8%, alcohol use disorder 14.9%, depression 13.9%, schizophrenia 12.9% Dx of medical patients with secondary psychiatric diagnoses not reported. Collaboration Morning rounds and weekly multidisciplinary meeting. Treatment Compulsory admission possible but not ideal (open unit). Normalizing milieu by non-segregated treatment of medical and psychiatric patients. Flexible bed allotment. Occupational and recreational therapy, individual therapy, family involvement, off-ward group activities. LOS Mean 6.5 days, range 2-29. Funding NR* Aftercare NR*</p>
AE3	<p>Comprehensive Medicine Unit at Stanford Hospital, USA (Koran & Barnes, 1982)</p>	<p>Hospital type and size Teaching hospital of Stanford Medical School, size 663 beds. Unit size and embedding Newly created unit, one of several proposals competing for available space, renovation budget. 13 beds at a building one-half mile from the hospital's main center. Ward features During physical renovation no walls could be torn down or broken into, thus preventing installation of a one-way observation mirror and conversion of two patient rooms into one large activity-dining area. A color scheme emphasizing rusts, off-whites, warm golds in carpets, and forest green accent in furniture was selected.</p>	<p>Referral NR* Age >= 16 years Population Medical disorders complicated by severe depression, anxiety, or psychosis, chronic pain syndromes, psychiatric disorders complicated by medical disease. Patients are not admitted if they are intentionally violent, acutely suicidal and thereby requiring constant supervision, un-cooperative and requiring a locked ward, or under sixteen years of age. Collaboration Weekly staff meeting and multidisciplinary care planning meetings 3x/week (also attended by ‘other staff’). Scheduled and informal meetings among the entire treatment team are crucial to the success of this integrated treatment approach. Treatment Compulsory admission not possible. Medical-psychiatric-nursing-psychological evaluation (medical history, psychiatric history, physical examination, mental status examination, laboratory tests, nursing care assessment, family interview, symptom self-report rating</p>

		<p>Natural oak was used in additional accents whenever possible. The nursing station desk was kept low to avoid placing a barrier between patients and staff. Patients, families, and staff find the total effect warm and friendly.</p> <p>Medical staff Psychiatrist (MD) + psychiatrists (A) and physician from dept. of Medicine (A). Psychiatry + medical and psychiatry resident</p> <p>Nursing staff RN medical nursing staff + psychiatric cross training by medical director and clinical nursing coordinator. Nurses float to other medical and surgical units according to staffing needs.</p> <p>Other staff Psychologist, social worker, occupational therapist, physical therapist, and dietician on a consultative basis. Unit clerk.</p>	<p>forms, a behavioral assessment, and, as indicated, psychophysiological testing) and plan. Standard medical management and pharmacotherapy, nursing interventions promoting self-care, occupational therapy, individual and group psychotherapy, behavioral interventions, family involvement, psychoeducation (patients and family), involving community resources in follow-up care. Physical therapy, nutritional counseling and special diets.</p> <p>LOS NR*</p> <p>Funding Medical beds. The local Professional Standards Review Organization (PSRO) staff argued strongly that the criteria used by CMU staff to justify hospital stay should be the same as those used for other medical units. To this we only partially agreed. We insisted that patients whose psychiatric symptoms required hospital treatment after stabilization of their medical condition would continue treatment on the CMU rather than be transferred for additional psychiatric care. We argued that transfer would disrupt psychiatric treatment and might prolong hospital stay compared to continuous treatment on the CMU.</p> <p>Aftercare NR*</p>
AE4	<p>Combined medical specialties unit at Duke University Hospital, USA (Fogel et al., 1985; Stoudemire et al., 1983; Stoudemire et al., 1985; White, 1988)</p>	<p>Hospital type and size University hospital, size 900 beds</p> <p>Unit size and embedding 15 beds, medical setting, open ward</p> <p>Medical staff Psychiatrist (co-MD, C, can become primary attending if psychiatric illness is primary therapeutic focus), internist (A, co-MD), internists admit + medical subspecialty consultants + psychiatry and medical residents</p> <p>Nursing staff RN medical nursing staff at intermediate care level, cross-training NR*</p> <p>Other staff NR*</p>	<p>Referral 50% transferred from other medical units</p> <p>Age >= 16 years, mean 46.2 years SD ± 14.2 years, fewer than a quarter of the patients were over age 65.</p> <p>Population No compulsory admission. Psychosomatic population that frequented internal medicine clinics; the vast majority had sought care initially from their internists, had not responded to outpatient care, and had usually been to many physicians before being referred to a university medical specialist and admitted to this unit. Medically ill patients with depression and anxiety, depression or anxiety presenting by physical complaints, complex symptoms/diagnostic dilemma's, psychophysiologic disorders, early dementia or dementia and depression, polypharmacy with need of evaluation and alteration. Bedridden patients are accepted on rare occasions if the patient provides a private-duty nurse. Critically ill patients are initially stabilized on the acute medical wards. Cannot be actively suicidal, homicidal, or otherwise require a locked ward. Depression (54% some form of depression discharge Dx) and anxiety, somatization, coping problems, emotional deprivation, abuse, loss Nonspecific musculoskeletal and gastrointestinal pain (including fibromyalgia and irritable colon), and tension headache.</p> <p>Collaboration Admission by internist, evaluation at time of admission by psychiatrist. The internist, psychiatrist, and nursing staff then meet in a joint diagnostic and therapeutic conference to assess the initial results of the medical-psychiatric evaluation and develop a plan of treatment. Continuity of treatment team and location. Primary nursing care model. The internist plays a major interpretive role in explaining to the patient the basis for his symptoms. The internist provides an excellent entree for the psychiatrist to work with the patient in more intensive psychologically oriented treatments. The internist continues to support the patient during the transition from diagnostic evaluation to psychotherapeutic intervention. This approach avoids the patient's fear of "being abandoned" by the internist. If the psychiatric component of the patient's illness becomes the primary therapeutic focus, the psychiatrist may become the primary attending physician. The internist at that point remains actively involved in the patient's care from a consulting position.</p> <p>Treatment Compulsory admission not possible. The initial part of the hospitalization tends to focus on diagnostic aspects of the case with the admitting internist directing the diagnostic studies. In case of psychosomatic illness, the studies are thorough enough to reassure both the patient and the physician that the illness is not life-threatening and does not require surgical intervention. At the same time, the psychiatrist assesses the role of psychological factors, thus expediting the initial evaluation and choice of tests. Nurses wear uniforms. Stress management program with educational approach. Individual and group psychotherapy. Extensive other therapies. Psychopharmacologic therapy. Biofeedback. Neuropsychological testing. Hypnotherapy. Physical therapy. Pain management consultation. Smoking cessation therapy. Sexual dysfunction therapy. Vocational rehabilitation counseling. Cardiac rehabilitation. Occupational therapy. Marital counseling. Dietary instruction. Family involvement. Health planning for the future is also orchestrated by the internist, including specific instructions related to diet and weight, appropriate exercise programs, elimination of habits such as smoking and drinking, and stress reduction. The patient is gradually encouraged to assume increasing responsibility for his/her health as the time of discharge approaches. No ECT.</p> <p>LOS Mean 14 days</p> <p>Funding</p>

			<p>Medical beds. DRG reimbursement for Medicare patients. Medical attending receives direct reimbursement from third-party coverage for daily care. Charges for psychiatric treatment beyond initial consultation are covered variably by different insurance plans. Although the majority of charges are paid, some are not, and the admitting internists and psychiatrists have a reimbursement risk-sharing arrangement.</p> <p>Aftercare Of patients referred from other medical units, <10% got outpatient follow-up by psychiatrists.</p>
AE5	<p>Medical-Psychiatric Unit at St. Mary's Hospital & Medical Center, San Francisco, USA (Hoffman, 1984)</p>	<p>Hospital type and size Private teaching hospital, size 550 beds.</p> <p>Unit size and embedding 14-beds located on a 24-bed psychiatry ward.</p> <p>Ward features Open unit.</p> <p>Medical staff Psychiatrists (MD + A) + medical or surgical attending (A) + psychiatric residents + specialty consultants. Personnel union with C-L service.</p> <p>Nursing staff Mostly medical nursing staff, cross-training NR*</p> <p>Other staff Social workers, occupational therapist.</p>	<p>Referral Two-thirds of MPU patients are admitted by the hospital's psychiatric and medical attendings, and the remainder by outside physicians, agencies, community mental health center crisis units, and local HMOs, the latter two by contractual arrangement.</p> <p>Age Elderly and adult; >60% are over the age of 60.</p> <p>Population In broad terms, the presenting problems fall into one of two categories: to rule out or determine organic etiologies of behavioral disturbances, or to manage coexisting neuromedical and behavioral problems. The latter patients are often severely confused, agitated, or troublesome in other ways, eg, suicidal or poorly compliant with medical regimens. The level of care offered by the MPU equals that of the other medical/surgical units in the hospital, excluding intensive care units, so that acuity of illness never represents an obstacle to admission. The major result of the recent changes has been the shift to a caseload with a much higher acuity of illness. Whereas at its inception ten years ago the unit emphasized psychosomatic disorders and geropsychiatry, it has by now attained the status of an acute medical unit with added expertise in behavioral management.</p> <p>>60% delirium, dementia, and depression, the latter usually of suspected organic etiology or accompanied by acute medical illness. Other diagnoses: neurological illness with behavioral symptoms, psychosomatic disorders, acute medical illness with behavioral management, alcohol or substance abuse. Medical Dx NR*</p> <p>Collaboration Compulsory admission not possible. Collaborative management. Daily joint ward rounds.</p> <p>Treatment Outreach Team performs community liaison activities, arrange admissions, hold family meetings, coordinate discharge planning, and follows-up after discharge.</p> <p>LOS Median 4 days. Thirty-seven percent of patients were discharged within 7 days, 47% within 14 days, 76% within 21 days, and 87% within one month.</p> <p>Funding Utilization review can be a particular problem for units treating neuropsychiatrically impaired patients; however, due to the skill of our Outreach Team in effecting placement, decertified days for any patient rarely exceeded two.</p> <p>Aftercare NR*</p>
AE6	<p>Medical Psychiatric Unit at Erie County Medical Center, Buffalo, USA (Fava et al., 1985; Molnar et al., 1985; Muqtadir et al., 1986)</p>	<p>Hospital type and size Major teaching affiliate of the State University of New York, size NR*</p> <p>Unit size and embedding 20 beds on existing ward with new mission definition, part of 80-bed psychiatry ward</p> <p>Ward features NR*</p> <p>Medical staff Medical director (P) + psychiatrists + internists + psychiatric resident</p> <p>Nursing staff RN and LPN psychiatric? nursing staff, cross-training NR*</p> <p>Other staff Social workers, paraprofessionals</p>	<p>Referral NR*</p> <p>Age 40.4 ± 17.1 years</p> <p>Population Patients with concomitant psychiatric and medical illness requiring hospital care who cannot be managed satisfactorily either on standard psychiatric units or on the medical-surgical floors. As there usually are not enough patients who fully satisfy MPU intake criteria to occupy the entire unit, psychiatric patients without medical illness also are admitted to the MPU on a space-available basis in order to utilize beds efficiently. Highly agitated or otherwise disruptive psychiatric patients without medical illness are excluded. Those requiring very complex or intensive medical interventions go to medical-surgical floors with psychiatric consultative support. Schizophrenia (37%), adjustment disorders (17.5%), bipolar disorder (8.5%), organic mental disorder (8%), major depressive disorder (6.5%), conversion (1.5%), alcoholism (1.5%) Medical Dx NR*; 30% had no medical diagnosis.</p> <p>Collaboration Collaboration and rounding model NR*</p> <p>Treatment Compulsory admission possible. Routine protocolized medical screening (medical history, physical examination, laboratory tests) and regular monitoring of vital signs. Treatment program for psychotic pregnant patients with coordination of psychiatric, obstetric and perinatal care. Surgery, special medical diagnostic tests (EEG, CT, endoscopic and radiologic procedures), consultations other than psychiatric, non-psychotropic drugs, vitals every shift, IV and dressings. Burn treatment, tracheal suctioning, administration and monitoring of IV-fluids.</p>

			<p>LOS Mean 13.2 days Funding NR* Aftercare NR*</p>
AE7	<p>Psychiatric-medical unit at Mount Sinai School of Medicine, New York, USA (Goodman, 1985)</p>	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 23 beds, conversion of one of four psychiatric inpatient wards</p> <p>Ward features Open ward fully equipped to provide routine medical diagnosis and care.</p> <p>Medical staff Psychiatrist (MD, A) + internist (A) + psychiatric residents + close involvement of geriatric medicine staff + medical students</p> <p>Nursing staff RN psychiatric nursing staff supplemented with medical RNs</p> <p>Other staff Social worker, activities therapist</p>	<p>Referral Psychiatric emergency room (38%), the rest of the general hospital after screening for transfer by the C-L service (21%), other hospitals, and private psychiatrists.</p> <p>Age >13 years</p> <p>Population Both ambulatory and bedridden patients. Patients are excluded when disposition rather than diagnosis is the main reason for admission; when they require continuous monitoring, respirators, orthopedic traction, or intensive care facilities; or when they are in coma. Patients that need the more intensive treatment of the medical/surgical wards are transferred. Empty beds are made available to patients without medical illness since maximum patient census must be maintained. Psychiatric and medical disorders coexisting independently (24%); medical illness causing or contributing to psychiatric disorders (35%); psychiatric illness causing or contributing to medical disorders (7%); illnesses such as anorexia nervosa, factitious illness, and somatoform disorders; and illnesses requiring psychotropic drugs in which medical illness may necessitate caution, special treatment, or monitoring. Organic mental disorder (25%), major depression (24%), personality disorder (11%), schizophrenia (8%), substance use disorder (8%) most common medical Dx dementia, diabetes mellitus, and hypertension; 29% psychiatric Dx only, 71% had psychiatric and medical Dx.</p> <p>Collaboration Thrice weekly ward rounds followed by staff management meeting. Daily medical care is the responsibility of the psychiatric resident staff under the supervision of the internist. Formal medical rounds twice weekly. All PGY-2 and PGY-3 psychiatric residents take nighttime calls, whether or not assigned to the psychiatric-medical unit, with back-up medical consultation provided by the medical resident on call for the hospital. Weekly community meeting and staff meeting. Weekly medical and psychiatric clinical case seminars and conferences.</p> <p>Treatment Compulsory admission NR*. Individual patient sessions under supervision of psychiatrist, medical care under supervision of internist. Protocolized medical screening, monitoring of vitals. Weekly community and staff meetings. Family involvement+ Fully equipped to provide routine medical diagnosis and care.</p> <p>LOS Mean 24 days (for patients <65 years), mean 26 days (for patients >65 years). No weighted mean can be calculated, estimation is 25 days.</p> <p>Funding NR* Aftercare Home (82%), medical/surgical wards (6%), psychiatric unit (<1%), chronic care facility (8%), left and did not return (3%). Follow-up: private care (38%), clinic care (46%), to be arranged (3%), death (<1%), no follow-up (13%).</p>
AE8	<p>Psychiatry-medical unit at Rhode Island Hospital, Providence, USA (Fogel, 1985; Fogel et al., 1985)</p>	<p>Hospital type and size University-affiliated private teaching hospital, size 719 beds</p> <p>Unit size and embedding 19-beds on former psychiatric unit, the only psychiatric unit in the hospital.</p> <p>Ward features Open ward</p> <p>Medical staff Psychiatrist (MD) + internist or subspecialist (C), medical coverage for emergencies by medical residents. Educational effort to attending physicians and nonmedical staff by medical director</p> <p>Nursing staff RN psychiatric nursing staff, RN with recent medical/surgical or ICU experience each shift, in-service training</p> <p>Other staff</p>	<p>Referral Problem cases encountered on the consultation-liaison service: 20% directly from medical/surgical services, the remainder (80%) were admitted directly.</p> <p>Age 54.1 ± 18.3 years</p> <p>Population Known psychiatric disorders occurring together with acute medical illness, patients with psychiatric complications of medical disease, patients requiring somatic antidepressant treatment but at high risk for complications, and patients posing diagnostic problems requiring the resources of the general hospital. After those patients, internal transfers from the medical and surgical services were given the next highest priority. Elective admission was discouraged if a patient's major problem was the need of a disposition, or if the patient had an uncomplicated mental disorder easily treatable in a conventional setting. Patients who are psychotic on acutely suicidal are admitted as long as they are voluntary and capable of being managed on an unlocked ward. Informal limit of 3 bedridden patients. Usually no more than 5 of the 19 beds were occupied by patients with severe, acute medical illness. The typical patient on the psychiatric- medical unit became a middle-aged or elderly person with a chronic medical illness combined with depression. Most of the patients with medical illness were relatively stable, despite their potential for medical decompensation. The number of unstable patients was limited to three or less. Patients who developed severe medical problems out of proportion to their psychiatric</p>

		Other staff NR*	<p>difficulties were to be transferred to the medical service. If, on the other hand, the severe medical problems were accompanied by psychiatric problems of equal magnitude, every effort would be made to keep the patient on the psychiatric-medical unit, despite the increased demand for nursing time. Depression (>67%) Medical Dx in 69,1%, mostly drug intoxication, hypertension, diabetes mellitus, ischemic heart disease, cerebrovascular disease, and thyroid disorders.</p> <p>Collaboration Patients are admitted by psychiatrists. Medical and subspecialty consultants are involved from the first day of hospitalization. Treatment team meetings, case conferences, continuing medical education activities.</p> <p>Treatment Compulsory admission not possible. Nurses wear street clothes. The first days of hospitalization focus on establishing a multiaxial diagnosis and on evaluating medical problems in detail; the remainder consisted mainly of psychiatric treatment. Interpersonally oriented therapy group, ward meeting for all patients, recreational activities. Frequent use of ECT. Psychotropic drugs. EEG, CT scan. Intravenous therapy, total parenteral nutrition, nasogastric feeding, respiratory therapy, wound care, chest tube management, and cardiac monitoring. Patients requiring mechanical ventilation continued to be excluded from the unit.</p> <p>LOS Mean 23.1 days</p> <p>Funding Daily psychiatric charges, including psychotherapy fees, are directly paid by third parties. Medical/surgical fees beyond initial consultation are covered variably by different plans, and the patient is often obliged to pay all or part of the fees for medical follow-up. No formal risk-sharing arrangement for unpaid fees. Because the majority of Rhode Islanders are covered by Medicare or Blue Cross plans with more generous benefits for general hospital inpatient psychiatry, the increased length of stay did not create major reimbursement problems.</p> <p>Aftercare 5% is transferred to primary care of nonpsychiatric physicians elsewhere in the hospital. Patients were likely to receive outpatient psychiatric follow-up. 8.9% disposition to institutions.</p>
AE9	Behavioral Medicine Program at Rye Psychiatric Hospital Center?, Rye, New York, USA (Moss & James, 1986)	<p>Hospital type and size Private community general hospital, size NR*</p> <p>Unit size and embedding 12 beds, embedding NR*</p> <p>Ward features NR*</p> <p>Medical staff Physician (A) + behavioral medical consultant + other medical consultants as needed</p> <p>Nursing staff Nursing staff.</p> <p>Other staff Psychologist, physical therapists, occupational therapists, recreational therapists, nutritionists, social workers, biofeedback technicians.</p>	<p>Referral NR*</p> <p>Age Mean 39.7 years, range 11-96</p> <p>Population Open to medically stable patients, capable of transfer out of bed without assistance. Chronic, benign pain; eating disorder; stress/emotional disorder; pulmonary disorder and other medical disorders, e.g. gastrointestinal, cardiovascular, neurological etc.</p> <p>Treatment Compulsory admission NR*. Protocolized, multi-disciplinary team approach emphasizing behavioral adaptation rather than symptom relief. Based upon functional analysis and contingency management. Comprehensive treatment planning, three phases: baseline, intervention and maintenance phase. Daily individual therapy. Psychotropics and other medications. Family involvement.</p> <p>LOS LOS mean 11 days (limited stay group) and mean 40 days (extended stay group), weighted mean $11.6 \times 11 + 40.0 \times 57 / 68 = 37.3$ days</p> <p>Funding Medicare and privately insured patients.</p> <p>Aftercare NR*</p>
AE10	Behavior Evaluation and Treatment Unit at Milwaukee County Medical Complex / Medical college of Wisconsin, USA (Harsch et al., 1989; Young & Harsch, 1986, 1989)	<p>Hospital type and size NR*</p> <p>Unit size and embedding 8 beds, psychiatric unit</p> <p>Ward features Newly developed, conceived as a psychiatric program but developed with consideration of the guidelines for general medical services. Individual rooms are equipped similarly to those on a medical floor, with oxygen availability, a voice 'call-light' system, and hospital beds being standard for each patient room. Equipment for intravenous support, suction, dressing changes, blood-sugar monitoring, and electrocardiography is continuously available.</p> <p>Medical staff</p>	<p>Referral C-L service (30-40%), other psychiatric units (10%), community or emergency services (10-20%).</p> <p>Age NR*.</p> <p>Population Patients with a psychiatric condition that may be chronic but requires active treatment on an inpatient service, and who in addition have a significant complicating medical problem. Patients with a primary medical or surgical condition (often, but not always, chronic or recurrent) and whose evaluation or treatment is complicated by an acute behavioral problem. Patients who on initial evaluation have a serious behavioral problem that requires hospitalization and has an unclear etiology, or else a physical problem is suspected to underlie the behavior (largest group). Patients who may require extended physiologic monitoring and also acute nursing care. Emphasis on patients that can benefit from group and milieu therapy.</p> <p>Affective disorder (41%), schizophrenic disorder (32%), Organic mental syndrome (11%), somatoform disorder (10%), alcohol/substance disorder (3%) CNS disease (n=29), endocrine/metabolic (n=17), gastro-intestinal (n=10), adverse drug reaction (n=6), cardiovascular (n=4), orthopedic (n=3). All patients admitted are required to have psychiatric and a medical/surgical diagnosis or at least a suspected dual diagnosis at admission.</p>

		<p>Psychiatrist (MD) + internist (part-time internal medicine faculty consultant who performs rounds with a resident assigned to general medical consultation) + medical resident + medical students.</p> <p>Nursing staff RN medical nursing staff with commitment to working with psychiatric patients, rotation system to medical floors and v.v., continuing education in-service psychiatric training</p> <p>Other staff Psychologist, social worker/family therapist</p>	<p>Collaboration Multidisciplinary meetings can be used to maintain a balance between medical and psychiatric concern. Primary nurse model of care.</p> <p>Treatment Compulsory admission NR* Blending of traditional medical and psychiatric influences. Daily group experience is central focus. Milieu management. The patients are asked to wear hospital gowns for the first few days of their stay and street clothes thereafter. Nurses wear uniforms. Primary nurse model of care. Vital signs, suicide precautions, seclusion and restraint, intravenous fluids, and finger sticks for blood chemistry. Structured psychiatric treatment program. Somatic therapy, (group) psychotherapy are interspersed with medical diagnostic and treatment regimens. Nurses and medical students can be co-therapists. Occupational and recreational therapy. Behavioral therapy. Physical therapy. Speech therapy. Family involvement+</p> <p>LOS Mean 16.8 days.</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE11	<p>High-acuity (Type IV) integrated medicine and psychiatry inpatient program at University of Iowa Hospitals and Clinics, Iowa City, USA (Chan et al., 2018; R. G. Kathol et al., 1989; Kishi & Kathol, 1999)</p>	<p>Hospital type and size University hospital, size 900 beds</p> <p>Unit size and embedding Self-contained, 15 beds located on internal medicine ward in the midst of other primary care inpatient units in the general hospital</p> <p>Ward features Locked ward renovated to provide clinical and safety components that would allow the same type of care provided on other general IMWs and on the acute general psychiatry wards. Core medical features included medical gases in all rooms, wide doorways, an infectious isolation room, a physical examination room, clean and dirty utility rooms, and space for medical equipment. Core psychiatric features included an activities room; a seclusion room; a nourishment room; a group/family therapy room; patient observation and staff communication capabilities through- out; sturdy furniture; shatterproof windows; barricade-proof doors; shortable electric sockets; tamperproof ceilings; breakaway curtain rods; the absence of potentially dangerous objects, such as cords, sharp objects, plastic bags, etc.; and laundry facilities. Administered through dpt. of Internal Medicine</p> <p>Medical staff Dual-trained or internist and psychiatrist (A, MD) or internist (co-A) and psychiatrist (co-A), internal medicine and psychiatry residents</p> <p>Nursing staff Nurses with medical and psychiatric skills, recruitment and in-service training.</p> <p>Other staff Pharmacist, social worker, physiotherapist, occupational therapist, and recreational therapist.</p>	<p>Referral Physicians in Iowa (40%), emergency room or clinics (30%), in-house transfers, primarily from IMWs (30%).</p> <p>Age Mean (\pm SD) 47 \pm 17 years</p> <p>Population Adults with both acute medical and psychiatric illness, allows for obstetric patients. All categories of patients are evaluated and treated. Exclusion: cardiac monitoring, treat patients on ventilators, or take patients requiring isolation with positive pressure laminar flow. Mood disorders (20%), psychosis (17%), delirium (17%) and substance related (13%). Medical Dx: neurological presentations (19%), medication adjustment and adverse drug effects: pharmacological (30%), intoxications or overdoses (25%).</p> <p>Collaboration Co-attending model; joint review of patient progress and daily joint patient visits.</p> <p>Treatment Compulsory admission possible. Most medical and surgical services (excluding cardiac monitoring, mechanic ventilation, or infectious isolation) and all psychiatric assessment techniques and treatments available (including behavior modification, amytal/benzo interviews, ECT). 24-hour physician coverage of both medicine and psychiatry.</p> <p>LOS Mean 17.5 days, median 13 days</p> <p>Funding The Type IV program was designated DRG nonexempt to allow admission of patients by both primary care physicians and psychiatrists.</p> <p>Funding With these components, it has become recognized by providers and insurers as both a medicine or a psychiatry service provider. Dual-trained providers bill as medicine; otherwise, the psychiatrist bills as consultant</p> <p>Aftercare Disposition categories include personal residence; nursing or county home; long-term, specialized treatment facilities; or jail.</p>
AE12	<p>Medical-Psychiatric Unit at Ottawa General Hospital, Ottawa, Canada (Swenson & Mai, 1992)</p>	<p>Hospital type and size General hospital, size NR*</p> <p>Unit size and embedding 6 beds on (existing) 49-bed psychiatric ward, part of hospital psychiatry service</p> <p>Ward features NR*</p> <p>Medical staff</p>	<p>Referral Emergency room (61% of admissions), and C-L service (39% of admissions).</p> <p>Age Mean (\pm SD) 39.5 \pm 14.7 years</p> <p>Population The patient should have a diagnostic and/or treatment problem with both medical and psychiatric components which is best managed with the patient in hospital (7). The patient, given his or her medical problem, should be able to make use of the psychiatric treatment</p>

		<p>Rotating psychiatrists (MD) + psychiatry resident + intern + designated internist (C) and neurologist (C)</p> <p>Nursing staff Psychiatric nursing staff willing and able to administer medical treatment</p> <p>Other staff Occupational therapist, social worker, psychologist.</p>	<p>provided by the service. In addition, the medical and nursing staff must be able to manage the medical problem; the effect the patient has on the ability of the nursing staff to care for other patients must also be considered.</p> <p>Thirty-six of the 76 patients (47%) discharged from the MPU-IPS who had coexisting medical and psychiatric disease were considered to have had chronic psychiatric illness and developed acute medical or surgical illnesses. There were 24 patients who had psychiatric symptoms intrinsically related to their medical illness (32% of the MPU-DPS patients having both medical and psychiatric disorders). One patient with longstanding epilepsy developed an organic delusional syndrome, and another patient had severe depression secondary to chronic renal failure. Finally, 16 patients (21%) with coexisting medical and psychiatric illnesses had somatic symptoms resulting from underlying psychiatric disorders. Sometimes accepting patients not strictly med-psych.</p> <p>Affective disorders (21.1%), personality disorder (12.8%), adjustment disorder (12.8%), substance abuse and withdrawal (14.7%), somatoform disorder (11.0%), schizophrenia and other psychoses (11.0%) Neurological (39.0%), gastrointestinal (12.2%), Musculoskeletal (8.5%), Reproductive (8.5%), Pulmonary (7.3%), Cardiovascular (7.3%). Forty-eight patients had acute medical illness, and 13 patients had chronic, stable disease. The largest proportion of patients with coexisting medical and psychiatric illnesses admitted to our MPU-IPS had long-standing psychiatric illnesses, such as personality disorder or substance abuse, and developed medical or surgical problems. A significant number of these patients were admitted after the initial medical treatment for a suicide attempt by overdose. The medical problems of most of these patients had been fully resolved by the time they were admitted; they were admitted for assessment and/or treatment of their psychiatric disorder.</p> <p>Collaboration Co-management with consulting internist often necessary</p> <p>Treatment Compulsory admission NR* Individualized psychotherapy, pharmacotherapy, occupational therapy and several forms of group therapy. Psychopharmacologic treatment. Lumbar puncture, MRI, neuropsychological testing, EEG with video telemetry.</p> <p>LOS Mean 19.3 days</p> <p>Funding NR*</p> <p>Aftercare Twenty-seven (32%) of the 85 patients discharged from the MPU-IPS received psychiatric follow-up in the MPU-OPS. Patients with no medical illness were usually referred to the general psychiatric outpatient department (17 patients) or to a private psychiatrist (30 patients). Eleven patients did not receive psychiatric follow-up.</p>
AE13	<p>Medical-psychiatry unit at St Vincent's Hospital, Dublin, Ireland (Buckley et al., 1994; Farragher & Walsh, 1998)</p>	<p>Hospital type and size General hospital, size 550 beds</p> <p>Unit size and embedding 3-bed subunit of a 22-bed inpatient psychiatry unit located adjacent to general medical wards</p> <p>Ward features NR*</p> <p>Medical staff Psychiatric and medical/surgical staff</p> <p>Nursing staff Psychiatric nursing team</p> <p>Other staff Social worker</p>	<p>Referral Emergency department (79%) and other wards (21%)</p> <p>Age Mean 33 years (range 14-72)</p> <p>Population 1) patients who had carried out acts of deliberate self-harm (DSH) and were unfit to discharge immediately from the emergency department; and 2) patients who had psychiatric complications of medical illness or significant comorbid physical and psychiatric illness. Deliberate self-harm reason for admission in 77-82%, other admission reasons psychosis (6%), psychiatric symptoms with organic etiology (4.5%), suicidal ideation (4.5%), alcohol-related problems (3.5%), other (4.5%). Medical-psychiatric comorbidity in 12%. Depression (46%), personality disorder (19%), schizophrenia (9%), alcoholism (8%), organic (4.5%) Medical Dx: variety of endocrine, immunologic, cardiovascular, neurologic, internal, obstetric, surgical, neoplasm and pulmonary illness.</p> <p>Collaboration Admission to this unit was by joint approval of medical/surgical and psychiatric staff, and patients were reviewed daily by both teams. Discharge and aftercare were arranged jointly.</p> <p>Treatment Compulsive admission NR* Short stay crisis intervention program utilizing a conjoint care approach. Supportive ward milieu. A significant proportion of nursing time was spent in admitting, caring, and organizing discharge.</p> <p>LOS Median 2 days</p> <p>Funding NR*</p> <p>Aftercare The follow-up arrangements for the study group consisted of 33 (37%) patients being referred for psychiatric admission to either the St Vincent's general psychiatric unit (10) or to their base catchment area hospital (23). Eighteen of these patients had been admitted to the joint care beds following episodes of deliberate self-harm. Forty (45%) patients were referred for psychiatric outpatient follow-up.</p>

AE14	Medical Psychiatric Unit at the Royal Prince Alfred Hospital, Sydney, Australia (Gertler et al., 1995)	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 4-bed subunit in a 30-bed general psychiatric ward</p> <p>Ward features Facilities existed on the ward to enable specialized medical, surgical, and diagnostic procedures to be carried out.</p> <p>Medical staff Medical director (P) + consulting internist + admitting specialty + psychiatric resident</p> <p>Makes use of existing psychiatric unit medical and nursing staff</p> <p>Nursing staff Mixed psychiatric and medical nursing staff, continuing education (seminars, refresher courses), in-service training</p> <p>Other staff Occupational therapist, social worker, psychologist</p>	<p>Referral Emergency room (26%), C-L service (37%), outpatient (4.1%), general practitioner (5.5%), private psychiatrist (12.3%), other psychiatric hospital, community clinic (15.1%).</p> <p>Age 43.7 ± 17.7 (17-87) years [mean ± SD (min-max)]</p> <p>Population 1) the patient's medical/surgical problem no longer required acute care on the general ward and residual symptoms or continuing physical care would not interfere with the patient's participation in the ward therapeutic program; 2) the patient was sufficiently mobile to attend to his/her personal hygiene; 3) the patient was transferred to the MPU on a voluntary basis; 4) the patient was not suffering from drug or alcohol withdrawal, but could have a history of such abuse; 5) nursing staff had performed a pretransfer assessment whenever possible to ensure availability of appropriate nursing expertise and resources so that other patients would not be disadvantaged (e.g., reduced staff numbers at night); and 6) internists and surgeons who had previously cared for the patient on the general wards would continue to supervise the relevant aspects of the patient's management and be available in an emergency either to consult, or if necessary, accept transfer back to their care. 17 patients (23.4%) presented with clear psychiatric illness and coexisting serious medical problems. Twenty-four patients (32.9%) were found to be suffering from psychiatric illnesses related to primary medical problems. A further 20 patients (27.4%) developed medical problems secondary to an underlying psychiatric illness, and 12 patients (16.9%) developed medical problems secondary to substance abuse. Patients requiring frequent medical monitoring (e.g., cardiac monitors or pulse oximeters) were excluded, but those requiring less intensive medical care (e.g., blood glucose monitoring, intravenous fluids, supplementary oxygen) were accepted. Substance abuse (22.4%), affective disorders (18.1%), schizophrenia (15.5%), organic brain disorders (19.0%) Neurological (16.9%, e.g., epilepsy, cerebrovascular disease, pituitary adenoma); cardiovascular (16.9% e.g., cardiomyopathy, ischemic heart disease, congestive cardiac failure); musculoskeletal (16.9% e.g., polymyalgia rheumatica, ankylosing spondylitis, gout); and endocrine (16.9% e.g., hyper- and hypothyroidism, diabetes mellitus)</p> <p>Collaboration Senior internist attends weekly unit rounds, although his role was generally to educate and advise future directions for medical management rather than provide ongoing care.</p> <p>Treatment Compulsory admission NR* Participation in existing (psychiatric) ward activities such as individual, group, and occupational therapies with non-MPU patients. If necessary, they attended these activities in a wheelchair, or with mobile intravenous equipment.</p> <p>LOS Mean 22 days</p> <p>Funding Shares staff with psychiatric department, no extra cost.</p> <p>Aftercare NR*</p>
AE15	Combined medical-psychiatric inpatient unit at Kingsbrook Jewish Medical Center, New York, USA (Trappler et al., 1995)	<p>Hospital type and size General hospital, size NR*</p> <p>Unit size and embedding 20 beds, embedding NR*</p> <p>Ward features Open unit</p> <p>Medical staff Psychiatrists + rotating psychiatric residents</p> <p>Nursing staff Psychiatric nursing staff, psychiatric nurse coordinator</p> <p>Other staff Social worker, recreational therapist</p>	<p>Referral NR*</p> <p>Age NR*</p> <p>Population Patients are admitted to the unit because of psychiatric problems, the existence of concurrent medical problems is not necessary. Psychiatric Dx NR*, medical Dx NR*</p> <p>Collaboration NR*</p> <p>Treatment Compulsory admission NR* Biological treatment model with minimal use of expressive psychotherapy compatible with the Hassidic community view of mental illness. Vital signs are monitored rigorously. To replace the milieu approach, the medical-psychiatric unit features a medical environment that protects patients from open social exposure Recreation takes place in small groups or in one-to-one pairs with a recreation therapist. Emphasis on long-term maintenance on psychotropic medication. Behavioral intervention. As a further attraction to this community, the hospital has a kosher kitchen and a synagogue located close to the unit on the hospital premises.</p> <p>LOS Mean 21 days</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE16	Medical Psychiatry Unit at Tachikawa	<p>Hospital type and size General hospital, size 500 beds.</p>	<p>Referral Tokyo project (47%), outpatient clinic (27%), general hospital (16.3%).</p>

	<p>Hospital, Tokyo, Japan (Nomura et al., 1996)</p>	<p>Unit size and embedding 63-beds, embedding NR*</p> <p>Ward features Semi-locked ward; locked only at night. Two beds for intensive medical care, four seclusion rooms</p> <p>Medical staff Psychiatrists + psychiatry residents. Non-psychiatric physicians were frequently not available; it was also the opinion that these physical conditions should be treated by psychiatrists under the supervision of a non-psychiatric specialist.</p> <p>Nursing staff Psychiatric nurses with medical/surgical experience, in-service training, rotation system.</p> <p>Other staff Clinical psychologists, social worker</p>	<p>Age Mean (\pm SD) 54 \pm 16 years</p> <p>Population The MPU is available to psychiatric patients with no physical illness, although patients with combined physical and psychiatric illness are given priority for admission.</p> <p>Many cases in which ongoing care for conditions, such as electrolyte imbalance, decubitus, fever and central venous hyperalimentionation (CVH), was needed on a daily basis. Approximately 20% of inpatients had no physical disease. Psychiatric Dx: schizophrenia (58%), affective disorder (10%), dementia (6%), mental retardation (7%), neurosis/personality disorder (7%) Medical Dx: malignant tumors (18%), fractures (9%), hemorrhoids (6%), cataract (6%), liver disease (4%), ileus (3%).</p> <p>Collaboration Weekly educational unit rounds, continuing education (lectures).</p> <p>Treatment Compulsory admission NR* Long stay ward. Social rehabilitation. Family-like relationship with nurses and other medical staff (important in Japan) that was promoted through regular outings and dinners. Occupational therapy, recreation room, psychotherapy, seclusion.</p> <p>LOS Mean 122 days</p> <p>Funding Part of Tokyo project, designated treatment centers for psychiatric inpatients with concurrent physical illness.</p> <p>Aftercare NR*</p>
AE17	<p>Specialist liaison psychiatry unit in Leeds General Infirmary, Leeds, UK (Protheroe & House, 1999)</p>	<p>Hospital type and size Teaching hospital, size 1000 beds.</p> <p>Unit size and embedding 12 places for adult inpatients and day patients, independent unit/no general psychiatry unit</p> <p>Ward features NR*</p> <p>Medical staff Psychiatrists + named physician or surgeon</p> <p>Nursing staff Doubly qualified, with registered mental nurse (RMN) and registered general nurse (RGN) training.</p> <p>Other staff Social workers, occupational therapist, physiotherapist, dietician, clinical psychologist</p>	<p>Referral NR*</p> <p>Age Median 49 years, range 19-78 years</p> <p>Population Coexistent physical illness and mood disorder 39 (40.2%); physical illness with other comorbid psychiatric disorder 22 (22.6%); cognitive impairment complicating management 11 (11.2%); unexplained physical symptoms and abnormal illness behavior 25 (26%). Psychiatric and medical Dx NR*</p> <p>Collaboration Team approach. For patients with severe physical illness, close liaison is required between psychiatrists and doctors from other specialities, and a system of shared care with a named physician or surgeon has been developed on the unit.</p> <p>Treatment Compulsory admission NR* Physical, psychological and social interventions. Eclectic mix of therapeutic approaches: individual and group therapy, occupational therapy and individually tailored programs. Thirty-six of the patients in our care (37.1%) were treated under shared care for at least part of their stay. Eleven patients (11.3%) used specialist diagnostic services such as computerised tomography and endoscopy and seven (7.2%) underwent a surgical intervention during the admission.</p> <p>LOS Median 17.5 days</p> <p>Funding Specialist units - particularly in-patient units - face constant funding problems and the liaison psychiatry unit described here is no exception. Since this survey was undertaken, the unit has lost its clinical psychology input, and has faced two prolonged periods of bed closure due to underfunding.</p> <p>Aftercare 73 (78.4%) resulted in discharge home, 13 (14.0%) in discharge to day patient status, two (2.2%) in transfer to other psychiatric wards, two (2.2%) in transfer to medical wards and three (3.2%) in death.</p>
AE18	<p>Stress ward at Chang Gung Memorial Hospital, Kaohsiung, Taiwan (Chang et al., 2001)</p>	<p>Hospital type and size Teaching hospital, size NR*</p> <p>Unit size and embedding Number of beds NR*, section of psychiatric department</p> <p>Ward features NR*</p> <p>Medical staff Psychiatrists (A) + internists (C) and surgeons (C)</p> <p>Nursing staff NR*</p> <p>Other staff NR*</p>	<p>Referral</p> <p>Age Mean age was 46.3 years, range 18-77 years.</p> <p>Population Mostly stress-related disorders. Patients with minor mental disorders, in contrast to those with major mental disorders, are characterized as having intact reality testing and a low homicide or suicide risk. Major depression (65.2%) and anxiety disorders (20.1%); 20.7% comorbidity of personality disorders 48.8% had comorbid medical disorder. Approximately 57 percent of patients received consultations from at least one specialty during their index stay. Digestive diseases (17.7%) cardiovascular diseases (15.2%), respiratory diseases (11.9%), endocrine diseases (11.1%).</p>

			<p>Collaboration</p> <p>Treatment No compulsory admission. The model of the stress ward integrates the format of a therapeutic community with that of a medical-psychiatric unit. Internists or surgeons are not deliberately involved in the therapeutic team. Stress-oriented approach, by which psychiatric disorders are conceptualized products of complex interaction among biological, psychological and social factors. Dietary therapy, community meeting.</p> <p>LOS Mean 19.6 days</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE19	<p>Unité Psychiatrique Hospitalière Adulte at Geneva University Hospitals, Geneva, Switzerland (Alberque et al., 2009; Eytan et al., 2004)</p>	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 18 beds, part of the department of psychiatry, a team of healthcare workers was relocated from the psychiatric hospital to the general hospital.</p> <p>Ward features Open but lockable ward with monitored access. Two rooms can be transformed to seclusion rooms. Smoking room, dining room, as well as a group and family-therapy room. General-medical facilities include oxygen and suction in all rooms (except the secure rooms), a medical examining room, and a room housing medical equipment.</p> <p>Medical staff Psychiatrist (A) + internist (A) + psychiatry intern</p> <p>Nursing staff Mixed medical and psychiatric nursing staff</p> <p>Other staff Psychologist, physical therapist, social worker.</p>	<p>Referral Emergency department (19.1%), outpatient clinic (13.2%), general hospital (24.5%), psychiatric hospital (24.5%), private practitioner (17.2%), other (1.5%).</p> <p>Age 16-65 years.</p> <p>Population All psychiatric disorders are accepted. Patients who need cardiac monitoring, assisted breathing, or isolation with positive pressure laminar flow are not accepted. However, UPHA can provide most other medical and surgical treatments. 43.6% of patients were compulsory admissions. Mood disorders (53%), psychotic disorders (14.1%), substance abuse (13.6%). 90.6% of patients had psychiatric/medical comorbidity. Medical Dx: most frequent are neurological and gastro-hepatic (medical and surgical) disorders. Diabetes, hypertension, orthopedic problems.</p> <p>Collaboration Joint admission decision of psychiatric and internal medicine attendings and head nurse.</p> <p>Treatment Compulsory admission possible. Individual and group psychotherapy. Psychotropic medication. A program to treat psychiatric conditions linked to pregnancy, both peri- and post-partum, was created in 2000.</p> <p>LOS Mean 25.5 days, median 20.5 days</p> <p>Funding NR*</p> <p>Aftercare Referral at discharge for most patients was to ambulatory psychiatric services, although, since UPHA was allowed to admit CAs, more and more patients are sent back to the psychiatric hospital.</p>
AE20	<p>Medical psychiatric unit at Maastricht University Medical Center, Maastricht, the Netherlands (Leue et al., 2010).</p>	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding Number of beds NR*, located on the gastroenterology section of an internal medicine ward.</p> <p>Ward features NR*</p> <p>Medical staff Psychiatrist + gastro-enterologist + cardiologist</p> <p>Nursing staff Somatic and psychiatric nursing staff</p> <p>Other staff Psychologist, occupational therapists.</p>	<p>Referral General practitioners (GP), hospital consultants, or consultants from other health care facilities.</p> <p>Age Mean 52.8 years (S.D. = 15.1)</p> <p>Population The patient population was characterized by complex psychiatric and somatic comorbidity, varying from chronic somatic diseases (e.g., inflammatory bowel disease, heart failure, etc.) and combined affective disorders to functional syndromes and somatoform disorders (e.g., irritable bowel disease, noncardiac chest pain, etc.), or chronic severe mental illness combined with physical disorders (e.g., schizophrenia and diabetes mellitus, etc). Patients suffering from severe somatic conditions with a comorbid delirium were not admitted. Instead, delirium care was provided at the medical ward in question. Furthermore, patients with high suicide risk were not admitted to the MPU. Depending on the medical or psychiatric problem, these patients were either admitted to the general psychiatric unit (GPU) or remained to be admitted at medical wards. Anxiety (54%), mood disorders (45%) and somatoform disorder (36%) minor somatic diseases (20%), diagnosis of the circulatory system (15%), and the digestive system (14%).</p> <p>Collaboration Three consultants were working together on a regular basis: a gastroenterologist, a cardiologist, and a psychiatrist. A gate keeping function was provided by the psychiatrist and somatic specialists.</p> <p>Treatment</p>

			<p>Compulsive admission NR* Somatic, psychiatric, and psychological diagnostic procedures and somatic and psychiatric treatment as indicated [43], often in combination with cognitive behavioral therapy (CBT)- based reattribution of unexplained somatic complaints to stress-related experiences.</p> <p>LOS Mean 24.1 days</p> <p>Funding NR*</p> <p>Aftercare After admission, patients were referred to the psychiatric day clinic, the MPU outpatient department, or back to the referring consultant, depending on the patient's diagnosis and region of residence.</p>
AE21	MPU at Columbia University, New York, USA (Chan et al., 2018)	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding Number of beds NR* on general medicine unit</p> <p>Ward features Open unit</p> <p>Medical staff Internist (A) + embedded C-L psychiatrist (C)</p> <p>Nursing staff General medical nurses</p> <p>Other staff Social worker</p>	<p>Referral NR*</p> <p>Age NR*</p> <p>Population Acutely medically ill (MvS: adult?) patients with comorbid psychiatric illness. No obstetric patients.</p> <p>Collaboration Psychiatrist table rounds with internists and sees a subset of patients (comanagement model).</p> <p>Treatment Compulsory admission not possible. No seclusion. IV-medications, telemetry, oxygen, tube feeding, negative pressure for airborne isolation.</p> <p>LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE22	MPU at Hennepin County Medical Center, Minneapolis, MN, USA (Chan et al., 2018)	<p>Hospital type and size County Medical Center, size NR*</p> <p>Unit size and embedding 102 beds on psychiatry unit</p> <p>Ward features Locked unit, seclusion room.</p> <p>Medical staff Psychiatrist (A) and embedded internist/APP (C)</p> <p>Nursing staff Psychiatric nurses with additional medical training</p> <p>Other staff Pharmacist, social worker, mental health worker, occupational therapist, recreational therapist, clinical care coordinator, and psychologist</p>	<p>Referral NR*</p> <p>Age NR*</p> <p>Population Acutely psychiatrically ill (MvS: adult?) patients with acute or chronic comorbid medical illness.</p> <p>Collaboration Tiered system to determine how frequently medicine sees patients.</p> <p>Treatment Compulsory admission possible. Seclusion. IV-medications, oxygen, tube feeding.</p> <p>LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE23	MPU at Hackensack University Medical Center, Hackensack, NJ, USA (Chan et al., 2018)	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 24 beds on psychiatry unit.</p> <p>Ward features Locked unit, seclusion room</p> <p>Medical staff Psychiatrist (MD+A), embedded internist (C).</p> <p>Nursing staff Psychiatric nurses with additional medical training</p> <p>Other staff Social worker; recreational, music, art, and pet therapy; yoga; exercise specialist; nutritionist; and case manager.</p>	<p>Referral NR*</p> <p>Age NR*</p> <p>Population Acutely psychiatrically ill (MvS: adult?) patients with acute or chronic comorbid medical illness. Obstetric patients.</p> <p>Collaboration Internist and psychiatrist round on all patients.</p> <p>Treatment Seclusion. IV-medications including central lines, telemetry, oxygen, tube feeding.</p> <p>LOS NR*</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
AE24	Medical Psychiatry Unit at Amsterdam University Medical Center, Amsterdam, the	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding NR*</p> <p>Ward features Lockable ward, camera surveillance possible.</p>	<p>Referral 100% of referrals via emergency department.</p> <p>Age Median age 46 (range 18–94).</p> <p>Population</p>

	<p>Netherlands (Dekker et al., 2019)</p>	<p>Medical staff Trauma surgeon (A), embedded psychiatrist (C). Nursing staff Dually trained nursing staff. Other staff NR*</p>	<p>Paper focusses on trauma patients (est. 9% of total MPU population): trauma patients with single or multiple injuries as a result of unintentional or self-inflicted trauma, and with a comorbid psychiatric disorder. Psychiatric Dx: substance abuse disorder (39.1%), psychotic disorder (27.5%), mood disorder (26.4%), personality disorder (20.9%), cognitive disorder (9.7%). Medical Dx: unintentional trauma 42.2%, self-inflicted trauma 57.0%. Mostly blunt trauma (71.1%), penetrating (24.4%). Collaboration NR* Treatment Compulsory admission NR*. Multidisciplinary treatment program. LOS Median 10.02 days, range 0–160 Funding NR* Aftercare Home (34%, of which 18% received ambulant psychiatric care), psychiatric ward (33%), nursing home (15%), rehabilitation center (12%).</p>
E1	<p>Psychiatric geriatric joint patient unit at Ilford and District Hospital Group, Ilford, UK (Arie & Dunn, 1973)</p>	<p>Hospital type and size Geriatric hospital, size NR* Unit size and embedding 4 beds on existing 17-bed geriatric ward; rearrangement of existing resources, without extra money, staff, or space. Ward features The ward is divided into cubicles, and so can take patients of either sex. Medical staff Geriatrician (A) + psychiatrist (visiting 2-3 times a week/C) Nursing staff Geriatric nursing staff with no extra training Other staff Social workers</p>	<p>Referral Outpatient (81%), psychiatric hospital (14%), residential homes (3.5%), general hospital (1%) Age Elderly Population Mainly depression, some dementia Dehydration, infections, strokes, falls, reaction to drugs Collaboration No joint ward round since timetables were overstretched. Joint rounds only if desirable. Treatment Compulsory admission possible. LOS Mean 20 days Funding No extra funding. Aftercare Return to home (32%), died (14%), transfer to geriatric unit (31%), transfer to psychiatric unit (24%)</p>
E2	<p>Combined geriatric and psychogeriatric assessment unit at London Hospital, London, UK (Pitt & Silver, 1980)</p>	<p>Hospital type and size District general teaching hospital, size 400 beds Unit size and embedding 25 beds on existing psychiatric firm; 16 beds are nominally geriatric and 8 psychogeriatric Ward features Separate day and dining rooms, and two side wards for noisy or very ill patients. Medical staff Geriatrician (A) + psychiatrist (A) + residents Nursing staff Nursing staff Other staff Domestic assistants, physiotherapist, psychologist, dietician, chiropodist, social worker, ward clerk</p>	<p>Referral Age "Patients of pensionable age", 26% are aged 85+ and over. Population Geriatric admissions are typical of those taken into the acute wards of any geriatric service. The psychiatric admissions are selected: delirious patients, probably demented patients, and those with significant physical and psychiatric disorder. A final group consists of patients who present with non-specific symptoms, e.g. not eating, falling. Delirium, dementia, depression Medical Dx typical of acute geriatric ward, 54% medical Dx only Collaboration Joint case conference, individual rounds Treatment Compulsory admission NR* Assessment and short-term treatment, outdoor clothing is commonly worn. LOS 98% ≤ 1 month Funding Aftercare Home (47%), died (22%), geriatric bed (11%), psychiatric bed (5%), other hospital bed (4%), welfare home (8%), elsewhere (3%).</p>

E3	<p>Medical Psychiatry Unit at Emory University Hospital, Atlanta, USA (Kiernan & Stoudemire, 1989; Stoudemire et al., 1991)</p>	<p>Hospital type and size University hospital, size NR*</p> <p>Unit size and embedding 14 beds on fully independent unit.</p> <p>Ward features NR*</p> <p>Medical staff Psychiatrist (MD+A), personnel union with C-L service.</p> <p>Nursing staff All RN nursing staff</p> <p>Other staff NR*</p>	<p>Referral NR*</p> <p>Age Mean 68 years, range 18-92.</p> <p>Population Open to adults of all ages, but predominantly geriatric focus. Specializes in treating chronic and refractory major affective disorders of the elderly. The predominant type of patients treated on this unit were elderly, had concurrent medical problems, were on multiple medications and in many cases initially had some degree of cognitive dysfunction either secondary to their mood disorder (depression related cognitive dysfunction or depressive pseudodementia) or had early dementia (cerebrovascular or Alzheimer's disease). Another segment of the population suffered from deliria induced by a variety of metabolic disturbances or medications. Major depression 35%; major depression with dementia 25%; organic mental disorders 25% Medical Dx: cardiovascular disease, diabetes mellitus, COPD, and fluid-electrolyte and nutritional disturbances.</p> <p>Collaboration Interdisciplinary team rounds and staff meetings.</p> <p>Treatment Compulsory admission NR* Electroconvulsive therapy and cyclic antidepressants. Group, family and individual psychotherapies. Multimodal occupational therapy program. Family involvement+</p> <p>LOS Mean 22 days.</p> <p>Funding Scrutiny from utilization review staff to discharge patients as soon as clinically feasible.</p> <p>Aftercare NR*</p>
E4	<p>Combined Medical Specialties Unit, Richard Young Hospital, Omaha, USA (Bruns & Stoudemire, 1990)</p>	<p>Hospital type and size Private community hospital, size 124 beds.</p> <p>Unit size and embedding Outgrowth of the 12-bed geriatric psychiatric unit in the psychiatric hospital, placed within neighboring general medical hospital</p> <p>Ward features Medical setting, rooms equipped for the medical care. Psychiatric administration</p> <p>Medical staff Psychiatrist (A) + internist (C) + specialty consultation (C)</p> <p>Nursing staff RN mixed nursing staff + nurses' aides, cross-training.</p> <p>Other staff Social worker, recreational therapist, psychologist, unit secretary, consultation of hospital pharmacologist, consultation of home health care nurses in preparation for transition to home-based care.</p>	<p>Referral Primary source of referral: community social service agencies, nursing homes, groups with geriatric emphasis.</p> <p>Age NR*</p> <p>Population The primary reason for admission of these patients was the acuity of their psychiatric condition. Patients must be capable of responding to active, combined med-psych treatment and of participating in the therapeutic environment. Medical and nursing staff are generally able to care for an acuity of medical illnesses similar to that treated on a general medical floor. Exclusion: chronic organic mental disorders unchanged from previous evaluations, patients requiring hospice-type care. Major depression (56.49%), organic mental disorders (11.83%), dysthymic disorder (7.63%), paranoid state (4.2%), schizophrenic and bipolar disorder (2.67%) cardiovascular disease, orthopedic problems, gastrointestinal disorders, hypertension, cerebrovascular disease.</p> <p>Collaboration Physician-directed. Weekly multidisciplinary team meeting to define treatment goals, assess patient progress, and establish new goals. Each patient's family practitioner/internist becomes part of the treatment team and functions in partnership with the psychiatrist. Primary nursing care model. Medical coverage was handled in the same manner as in the rest of the hospital's psychiatric programs.</p> <p>Treatment Compulsory admission NR* Biopsychiatric treatment that follows a medical model in a medical setting. Blend of medical and psychiatric approaches and techniques. A comprehensive treatment plan that described the problem and established measurable goals and projected achievement dates should be part of the acute psychiatric treatment. Nurses provide focus for implementation of the treatment plan. Maintaining an appropriate balance between medical and psychiatric acuity is an ongoing issue that must be addressed so that both needs of the patient population are adequately treated. Discharge planning starts when the patient enters the hospital. Group therapy, recreational therapy, occupational therapy, stress management, family therapy, hypnotherapy, alcohol assessment, social services referrals, psychologic testing, ECT. Radiology (X-ray, CT-scans), dietary referrals, EKG, physical therapy, respiratory therapy, OR, Holter, hearing/monitoring, vocational rehab, speech therapy, spinal tap, thoracentesis, EMC, radiation therapy, excision of skin lesion. Family involvement+ Hospital's laboratory and diagnostic services.</p> <p>LOS Mean 23.76 days</p> <p>Funding DRG-exempt status requires a primary psychiatric diagnosis and also that the attending physician be a psychiatrist with nonpsychiatric physicians serving as consultants. The attending psychiatrists have experienced no unusual difficulty in receiving appropriate reimbursement. The Medicare reimbursement structure precludes "coattending" physicians. The experience of the nonpsychiatric physicians indicates that they are reimbursed only for consultations for treatment as needed for each individual condition. This has created occasional difficulties in ensuring consistent medical follow-up.</p>

			<p>Aftercare Disposition problems are frequently a direct cause of the length of stay being extended. Appropriate placement options are sometimes difficult to locate, particularly for dementia patients with severe behavioral problems.</p>
E5	<p>Geriatric medical/psychiatry inpatient unit (GMPU) at Clinton, USA (Porello et al., 1995)</p>	<p>Hospital type and size Private community general hospital, 54 beds. Unit size and embedding 20 beds Ward features Locked psychiatric unit developed in underused space previously occupied by a medical/surgical unit. Seclusion room, extensive psychiatric and safety features: clear, lexan, shatterproof coverings to all windows, window openings limited to 4 inches, bathroom doors hinged to swing both ways, non-weight-bearing fixtures, hooks removed, locked medication room, bell cords removed, occupation therapy space, loud activity space, quiet activity space, physical examination room with sink, seclusion room with bathroom access, exits locked, protective covers over all radiators. Medical staff Psychiatrist (MD, co-A)+ internist (co-A) Nursing staff Nursing staff Medical nursing staff with variable psychiatric experience Other staff Social workers, occupational therapists, physical therapists, psychologist, three mental health counselors, consulting neuropsychologist. Secretary.</p>	<p>Referral Nursing homes (57%). Ten percent resided in rest homes, 5% with extended families, and 3% in other settings where support was available. One quarter lived in their own homes where they or their spouse was the head of the household. Patients were referred for admission by several sources, including nursing home mental health consultants (43%), nursing home staff (13%), general hospitals (11%), outpatient psychiatrists (9%), emergency services (8%), primary care physicians (6%), elderly services agencies (5%), visiting nurses (2%), families (1%), and others (2%). No patient was self-referred. Age Mean 76 years (SD = 10), with a range of 39 to 96 years ; 6.5% <60 years. Population Frail geriatric patients with comorbid medical and psychiatric problems and functional disabilities. Primary reasons for referral to the unit included aggressive behavior (31%), depression (14%), psychosis (10%), suicide risk (9%), food refusal (8%), wandering (6%), disruptive behavior (5%), self-injurious behavior (3%), refusing needed medical care (3%), continuous yelling (2%), and sleep disorder (1%). Patients are admitted who meet utilization review criteria for acute psychiatric hospitalization and simultaneously require concurrent medical management and/or substantial physical assistance. Dementia with psychiatric complications (40%), depression (27%), schizophrenia (15%), delirium (6%), mania (6%) cardiovascular disease (43%), endocrinopathies (41%), hypertension (29%), musculoskeletal disorders (27%), gastrointestinal disorders (21%). Collaboration All patients are attended by both a psychiatrist and an internist, in a co-attending model. Psychiatrists serve as attending physicians of record. Psychiatrists make daily rounds and internists see patients as frequently as indicated, often daily, but at a minimum of twice per week. Psychiatrist leads multidisciplinary treatment team, twice weekly meetings. The absence from the team meetings of the internist has been a major weakness in the interdisciplinary collaboration. Six general internists in office-based private practice provide concurrent medical care. One internist functions as the permanent liaison internist. He is readily available as a resource to the medical director regarding medical policy and quality of care issues. The other internists serve in 4-month rotations. Primary care nursing model. Treatment Compulsory admission possible. Comprehensive geriatric assessment; relieve emotional distress, diminish disturbed behavior, improve function, and maximize independence. Initial and ongoing neuropsychiatric diagnostic evaluation. At the time of admission, a medical consultation is requested for initial physical examination and concurrent care. Psychopharmacotherapy, individual and group psychotherapy (supportive, expressive, emphasizing coping with late-life stressors). Neuropsychological evaluations. Psychosocial evaluations, family therapy, case management. Family involvement+. ECT not available. Radiology (X-ray, CT, MRI), ECG, urine analysis, lab, EEG, intravenous therapy, nasogastric feeding, Foley catheter care, wound care, arterial blood gas measurement. and respiratory therapies are provided routinely. Audiologic assessment. Invasive diagnostic or surgical procedures. Geriatric wheelchairs and lap or vest restraints are used to ensure the safety of patients at risk for falling due to instability or jeopardized by poor judgment related to severe dementia. The use of restraints is governed by the state mental health regulations. LOS Mean 15.4 days Funding Licensed as a psychiatric unit, DRG-exemption. Medicare and other fiscal intermediaries recognize the validity of concurrent care within this program and reimburse the physicians consistently, as long as each physician's services are related to a different primary diagnosis. Through careful admission and discharge planning, it was possible to maintain the average LOS at, or just under, 16 days, so that reimbursement consistently covered costs. Aftercare Nursing homes (58%), home (13%), intensive care or medical floors (9%), rest homes (9%), and with families (3%). Of the 25% that resided in their own homes, 60% were discharged home or with families, 23% were placed in long-term care facilities, and 11% were transferred for more intensive medical care. Of the 166 patients admitted from nursing homes, 13 were transferred to medical floors for intensive medical or surgical care and the remaining 153 were discharged directly back to a nursing home. Ninety-seven percent of this latter group returned to the same nursing home from which they had been referred.</p>
E6	<p>Centre for Elderly, Asklepios Klinik</p>	<p>Hospital type and size Community (acute) hospital, size NR*</p>	<p>Referral NR* Age</p>

	<p>Nord, Hamburg, Germany (Maier et al., 2007)</p>	<p>Unit size and embedding Interdisciplinary wards (64 beds) divided into two interdisciplinary units are core to the Centre for Elderly. The centre consists of traditionally designed geriatric (42 beds) and psychogeriatric (54 beds) wards, day hospitals and a memory clinic.</p> <p>Ward features Units fulfil criteria of medical wards: oxygen supplementation, nasogastric suction and intravenous antibiotic administration. To realize adequate psychiatric management, drug therapy such as rapid sedation, violence management, behaviour modification techniques, and others are available.</p> <p>Medical staff Geriatrists (A), psychiatrists (A). Neurologists provide on-site consultation.</p> <p>Nursing staff Mixed geriatric and psychiatric nurses brought together under one team, in-service training and rotation system</p> <p>Other staff Physiotherapists, speech therapists, social workers, ergotherapists, neuropsychologists</p>	<p>Persons over the age of 60.</p> <p>Population Patients with combined medical and psychiatric illness of medium to high acuity are allocated to an interdisciplinary ward under the medical attention of the department of geriatric medicine or psychiatry, depending on the main diagnosis on the day of admission. Psychiatric department: dementia (39%), followed by depression (28%) and psychosis (19%). Department of geriatric medicine: dementia, stroke, muscle/bone diseases and cardiovascular diseases (each approx. 15%).</p> <p>Collaboration Physicians work under the medical direction of the head of their department (departments of geriatric and psychogeriatric medicine) Patients are under the medical attention of the department of geriatric medicine or psychiatry, depending on the main diagnosis on the day of admission. Daily paper rounds. On request, ward rounds are conducted interdisciplinarily. Nurses and therapists are responsible for all inpatients on an interdisciplinary ward (unlike the attending who is a geriatrist of psychiatrist). Patients stay on the same unit, in the same room, under the treatment of the same team, using the same chart (TEMPA® system).</p> <p>Treatment Compulsory admission NR* Oxygen supplementation, nasogastric suction and intravenous antibiotic administration. To realize adequate psychiatric management, drug therapy such as rapid sedation, violence management, behaviour modification techniques, and others are available.</p> <p>LOS Median 18 days (geriatric medicine dept.), 26 days (psychogeriatric medicine dept.)</p> <p>Funding NR*</p> <p>Aftercare NR*</p>
E7	<p>Combined geriatric medicine/old age psychiatry unit at Cameron Hospitals, Windygates, UK (Astell et al., 2008)</p>	<p>Hospital type and size NR* Unit size and embedding 26 beds, embedding NR*</p> <p>Ward features Alarmed exits and pinpoint entry. The environment is reasonably calm and spacious when compared to an acute medical admission ward. There is separate accommodation for male and female patients allowing the ward to accommodate patients with sexually inappropriate behaviour or aggression.</p> <p>Medical staff Psychiatric (A?) and elderly consultants (A?) + general practitioner</p> <p>Nursing staff Mixed medical and mental health trained nurses</p> <p>Other staff Clinical psychologist (weekly input), occupational therapist, therapies coordinator</p>	<p>Referral NR* Age: "old age", 4% <70 years of age.</p> <p>Population Older people with complex medical and psychiatric needs. Dementia (100%). The majority of patients also had behavioural problems (81%). Approximately one-third (32%) were treated for depression while on the unit and a smaller group (11%) were treated for psychotic symptoms. Medical Dx NR*.</p> <p>Collaboration NR*</p> <p>Treatment Compulsory admission NR* Admission following assessment in an acute environment which identifies a need for ongoing assessment and management while awaiting nursing home placement.</p> <p>LOS NR*</p> <p>Funding NR*</p> <p>Aftercare Nursing home (59%), (24%), home (9%), NHS continuing care (6%), psychiatric hospital (3%)</p>
E8	<p>Joint elderly medicine– psychiatric ward at York district hospital, York, UK (Hanna et al., 2008)</p>	<p>Hospital type and size District general hospital, size 700 beds.</p> <p>Unit size and embedding 21 beds, embedding NR*</p> <p>Ward features NR*</p> <p>Medical staff Consultant in medicine for the Elderly (A?) + consultant old age psychiatrist (A?) + senior resident in medicine for the Elderly, residents from both Medicine for the Elderly and Psychiatry</p> <p>Nursing staff Even mix of registered mental nurses and registered general nurses of all grades, clinical nurse specialist</p> <p>Other staff</p>	<p>Referral Other hospital wards.</p> <p>Age >65 years with exceptions.</p> <p>Population Cognitive impairment/dementia (22), delirium (13) and depression (10) cerebrovascular disease, urinary tract infection (13), pneumonia/chest infection (9) and 'off legs'/falls (8).</p> <p>Collaboration There is regular (at least twice weekly) consultant input from both specialties, in a multidisciplinary team meeting. This facilitates gatekeeping (role for nurse specialist), shared decision making in end of life decisions and care planning.</p> <p>Treatment Compulsory admission NR*.</p> <p>LOS Mean 44 days</p> <p>Funding</p>

		Occupational therapist, physiotherapist, social worker, psychologist	The ward was funded from closure of long stay beds in elderly medicine and old age psychiatry. Aftercare There were 10 deaths in the cohort (21%). In terms of discharge destination for the other 38 patients, 21 (55%) were placed in long-term nursing home care, 15 (40%) returned home and two (5%) were transferred to the local psychiatric hospital.
E9	Elderly acute care Medical and mental health unit at Nottingham University Hospitals, Nottingham, UK (Goldberg et al., 2013; Harwood et al., 2011; Spencer et al., 2013; Tanajewski et al., 2015)	Hospital type and size University hospital, size NR* Unit size and embedding 28 beds, on a ward that was previously an acute geriatric medical ward Ward features Acute geriatric ward with five enhanced components. Medical staff Ward environment optimized to improve patient orientation and independence Geriatricians (A) + psychiatrists (C, twice weekly visits) Nursing staff Ward-based (geriatric) and specialist nurses. Three extra mental health nurses. Other staff Mental health nurses, mental health specialist, occupational, physiotherapist and speech and language therapists. Dietician. Unregistered health care assistants that work as therapy coordinators.	Referral Via acute medical admissions units. Age Median 85 years, IQR 80-88. Population Confused elderly that have delirium and/or dementia. Exclusion criteria: severely medically ill requiring intensive monitoring or therapy (critical care), or specialist medical intervention (e.g. severe acute gastrointestinal bleeding, respiratory support), those with overriding clinical need for another service (orthopedics, acute stroke), acute intoxication or overdose, those detained under Mental Health Act. Medical Dx NR* Collaboration NR* Treatment No compulsory admission. Staff were trained in recognition and management of delirium and dementia and the delivery of person-centered dementia care. A program of organized therapeutic and diversionary activities. Complex discharge planning is supported by a separate multidisciplinary advice team. Social care assessments (provided by local government authorities, not the NHS) are available on request, regardless of ward allocation. Physical restraints were never used. Patients had access to standard medical and mental health services, rehabilitation, and intermediate and social care. Formal cognitive testing, collateral cognitive and functional history, occupation therapy assessment, speech and language therapy assessment, dementia care plan, drug review, antipsychotic drug use, one-to-one care. Proactive family and carer involvement+ LOS Median 11 days Funding NR* Aftercare Home (74% including care homes), new care home placement (20%)
E10	LIJ Medical Center Psychiatric Inpatient Unit at Long Island Jewish Medical Center, New York, USA (Chan et al., 2018)	Hospital type and size Teaching hospital?, size NR* Unit size and embedding 25 beds on separate unit. Ward features Alarmed but open unit. Medical staff Internist (A) and nurse practitioner + embedded C-L psychiatrist + geriatric internist Nursing staff Medical nurses with additional psychiatric training Other staff Patient engagement specialist, social worker, case manager, and rounding by security twice daily.	Referral NR* Age: "elderly" Population Medically ill patients with behavioral problems; evolved into geriatric psychiatric dementia/delirium unit. Collaboration Triage by psychologist. Morning rounds with medicine, nursing, and psychology. Treatment Compulsory admissions NR* IV-medications, telemetry, oxygen, tube feeding. No seclusion. LOS NR* Funding NR* Aftercare NR*

Appendix 3c: Outcomes. *Aim number corresponds to the aims in Appendix 3a. The last column shows the level of evidence according to the GRADE system (23): A=high quality, B=moderate quality, C=low quality, D=very low quality.

Study	MPU	Outcomes	Aim*	GRADE
Withersty et al. 1980 (62)	AE1	<i>Recidivism and return to responsible activity pre and post conversion of psychiatric unit to psychiatric-medical unit</i> No significant differences for the pre- and post-unit conversion cohorts.	4	C
Fogel et al. 1985 (13)	AE4 and AE7	<i>Qualitative contrast of administrative and clinical aspects regarding two MPUs</i>	NA	NA
Fava 1985 (9)	AE5	<i>Clinical characteristics of MPU patients versus consultation psychiatry patients, including length of stay (LOS)</i> See Molnar et al. 1985.	4	C
Molnar et al. 1985 (64)	AE5	<i>Clinical characteristics of MPU patients versus consultation psychiatry patients, including length of stay (LOS)</i> Liaison-consultation service patients had a longer LOS (22.1±40.8 days), while Medical-psychiatric unit (13.2±12.3 days) and Psychiatric inpatient unit (13.5±9.9 days) patients had shorter but similar LOS.	3	C
Fogel 1985 (63)	AE7	<i>Clinical characteristics including length of stay (LOS) and average hospital bill per day pre and post conversion of psychiatric unit to psychiatric-medical unit</i> LOS on the unit increased from 13.9 to 23.1 days. No statistical testing. The cost of treatment on the psychiatry-medical unit increased at a greater rate than the cost of treatment elsewhere in the hospital.	3	C
Young and Harsch 1989 (65)	AE9	<i>Clinical characteristics including length of stay (LOS) of subsequent cohorts of patients admitted to a psych-med unit</i> LOS decreased from a mean of 20.5 days in 1984/1985 to a mean of 15.8 days in 1986.	3, 4	C
Kishi and Kathol 1999 (69)	AE10	<i>Clinical characteristics including functioning and length of stay of MPU versus internal medicine ward patients</i> Global Assessment of Functioning Scale (GAF) score improvement 19.5 (SD = 20.9, p<0.05), Karnofsky score improvement 24.3 (SD = 19.5, not significant) on the MPU versus GAF score improvement 11.2 (SD = 16.3, p<0.05), Karnofsky score improvement 22.4 (SD = 21.4, not significant) on the internal medicine wards. Total hospital LOS IMW 12.5 (8) vs. 17.5 (13) for MPU (F6.46; df1,198, p=0.01). The longer length of stay in the Type IV program is nearly entirely due to the time spent on other units before transfer to the Type IV program.	4	C
Swenson and Mai 1992 (66)	AE12	<i>Clinical characteristics including length of stay (LOS) of MPU versus general adult inpatients and psychogeriatric inpatients</i> LOS of MPU patients was similar to that of inpatients discharged from the general adult inpatient services, but shorter than that of patients discharged from the psychogeriatric service. MPU 19.3 ±21.2 days, geriatric psychiatry service 38.6 ±49.4 days (significantly different vs. MPU and general adult inpatient services), general adult inpatient services 18.6 ±18.9 days.	4	C
Gertler et al. 1995 (67)	AE13	<i>Clinical characteristics including length of stay (LOS) of MPU versus general psychiatry unit (GPU) patients</i> LOS was similar for MPU and GPU, i.e., an average of 22 ± 22.5 (1-133) days in the MPU and 25 ± 21.6 (1-110) days in the GPU.	4	D
Nomura et al. 1996 (68)	AE15	<i>Clinical characteristics including length of stay (LOS) and clinical improvement of first versus latter two years of operation</i> The average LOS shortened from 158 days to 122 days, although the difference was not significant. A total of 73% of physical illnesses were cured or improved on discharge, while 65% of psychiatric disorders remained unchanged.	4	D
Alberque et al. (11)	AE18	<i>Clinical characteristics including length of stay (LOS) in five consecutive patient cohorts</i> The average LOS increased significantly (p<0.001) from 14 days in 1999-2000 to 21 days in 2003-2004.	4	D
Leue et al. 2010 (70)	AE19	<i>Hospital costs (components: LOS, medical service use, psychiatric interventions) of MPU versus medical wards</i> Comparisons revealed lower costs of medical service use in favor of the MPU (-€104; 95% CI -€174 to -€35; p<0.01). However, cost of psychiatric intervention and cost of LOS were higher after MPU admission (respectively, +€165; 95% CI +€25 to +€305; p<0.01; and +€202; 95% CI +€170 to +€235; p<0.001). Total costs were higher after MPU admission compared to medical ward admission (+€263; 95% CI +€68 to +€458; p<0.01). These differences were not moderated by somatic diagnosis or previous pattern of admissions.	4	C
Maier et al. 2007 (21)	E7	<i>Clinical characteristics including length of stay (LOS), treatment quality as measured by structured staff interviews, and transfers pre- and post-opening of MPU</i> The majority of the interviewed employees stated that the treatment quality and the allocation of patients were improved. The number of transfers decreased significantly in both departments. During the first half-year of 2000, the median LOS in the centre was 22 days and decreased significantly to 18 days in 2001 (p < 0.001). During the period 2000 to 2001 The median LOS in the department of geriatric medicine was reduced from 16 to 14 days (p > 0.05) and 34 to 26 days (p < 0.05) in the department of psychogeriatric medicine.	3, 4	C
Goldberg et al. 2013 (71)	E10	<i>Clinical characteristics including days spent at home over 90 days after randomization, time spent in positive mood or engagement, staff interactions, family carers satisfaction</i> There was no significant difference in days spent at home between the specialist unit and standard care groups (median 51 v 45 days, 95% confidence interval for difference -12 to 24; P=0.3). Patients on the specialist unit spent significantly more time with positive mood or engagement (79% v 68%, 2% to 20%; P=0.03) and experienced more staff interactions that met emotional and psychological needs (median 4 vs. 1 per observation; p<0.001). More family carers were satisfied with care (overall 91% vs. 83%, 2% to 15%; p=0.004), and severe dissatisfaction was reduced (5% vs. 10%, -10% to 0%; p=0.05).	3, 4	B
Spencer et al. 2013 (72)	E10	<i>Qualitative assessment of carers' experiences of quality of care</i>	3	NA

		The main themes identified related closely to family carers' met or unmet expectations and included activities and boredom, staff knowledge, dignity and fundamental care, the ward environment and communication between staff and carers. Carers from the MPU were aware of, and appreciated, improvements relating to activities, the ward environment and staff knowledge and skill in the appropriate management of dementia and delirium. However, communication and engagement of family carers were still perceived as insufficient.		
Tanajewski et al. 2015 (73)	E10	<i>Cost-effectiveness analysis</i> The MPU was strongly cost-effective using usual criteria. The total adjusted health and social care costs, including direct costs of the intervention, at 3 months was £7714 and £7862 for MPU and standard care groups, respectively (difference -£149 (95% confidence interval [CI]: -298, 4)). The difference in QALYs gained was 0.001 (95% CI: -0.006, 0.008). The probability that the intervention was dominant was 58%, and the probability that it was cost saving with QALY loss was 39%. At £20,000/QALY threshold, the probability of cost-effectiveness was 94%, falling to 59% when cost-saving QALY loss cases were excluded	4	B