Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the editor

A Bronx tale: Exposure, containment and care on inpatient psychiatry units during COVID-19

1. Introduction

Inpatient psychiatric units pose a unique challenge during COVID-19 by virtue of the interactive nature of these units and the behavioral symptoms of serious mental illness which impede infection control [1–4]. Several reports have provided recommendations aimed at preventive strategies in order to maintain a COVID-19 negative unit [5–7]. Expanding on these reports, here we provide additional guidelines involving managing a COVID-19 outbreak, based on our experience in two inpatient psychiatric units serving the Bronx, when it was a COVID-19 epicenter within an epicenter in New York City [8,9].

2. The outbreak

The two inpatient units are located at two general hospital campuses, within the principal academic medical center serving the Bronx, NY, where approximately 6000 COVID-19 positive patients have been treated between the second week in March 2020 to the present.

2.1. Unit A

During the last week of March 2020, twenty-five psychiatric patients were treated on a 22-bed inpatient unit, all without any physical symptoms of COVID-19 illness. Despite following universal COVID-19 protocol recommendations, within a week, the first patient developed symptoms of fever, cough, nausea and vomiting and was found to be positive for COVID-19. This patient's roommates, though asymptomatic, were also found to be positive for COVID-19. Several staff members also began to display COVID-like symptoms and were sent home to self-isolate. By the next day, all but two patients were COVID-19 positive (88%).

2.2. Unit B

A few days after the outbreak on Unit A, the unexpected death of a medically asymptomatic patient on Unit B raised suspicion for COVID-19, although confirmation was not possible, as autopsies had been halted secondary to the COVID-19 pandemic. Subsequent testing for all patients identified five COVID-19 positive patients (17.2%).

3. Management

In recognition of the inevitability of further infection spread given the nature and vulnerability of inpatient psychiatric units, Unit A was converted into a COVID-19 positive unit while Unit B was designated a COVID-19 negative unit.

3.1. Unit A

While other psychiatric units attempted to isolate COVID-19 positive patients in their rooms with iPads, TV access and smartphones, those resources were neither accessible on our units nor safe for many of our patients. Attempts to have patients wear surgical masks and physical distance from staff and peers were often complicated by agitation, disorganization and impulsivity. Many patients had difficulty remaining in their assigned rooms and, when they came out, typically required frequent redirection. Recognition that all patient areas would need to be considered 'contaminated' allowed for the development of clear and consistent Personal Protective Equipment (PPE) and exposure protocols and guidelines for restarting therapeutic groups and other activities. Once a more explicit focus was placed on staff familiarity and compliance with PPE and distancing/exposure protocols, the unit experienced no additional staff cases of COVID-19. 'Green spaces' were established where use of potentially contaminated PPE was not allowed, such as the nursing station and clinical offices. Individual therapy and evaluations, therapy sessions, family therapy and discharge planning were carried out both live (staff in PPE) and via videoconference on hospital-provided tablets and smart phones, with some staff rotating off the unit to decrease exposure and promote social distancing. All patients were placed on 15-minute checks, as patients spent additional time isolated in their rooms. Additional therapeutic interventions included increasing patient access to loved ones through videoconferencing and leisure TV time in a common room to allow for increase in socially spaced interpersonal interactions in addition to structured groups. Individualized therapeutic activity packets were distributed to patients, with materials on coping skills, mindfulness, art projects and Sudoku. Staff also adopted the use of disposable portrait picture stickers attached to their gowns to allow patients to identify faces and facilitate rapport with their treatment team, a practice which has been hypothesized to improve patient and front-line staff wellness [10]. Additionally, staff established informal supports with each other, including text groups, to check-in and share coping strategies including humor.

By the second week of April, Unit A's adjusted therapeutic milieu was fully in place. Notably, there were no incidents of manual restraint or seclusion after the adjusted therapeutic milieu was implemented. Similarly use of 'as necessary' medication for anxiety and agitation had decreased 43%.

3.2. Unit B

Unit B remained mostly COVID-19 negative after the initial outbreak, though subsequent COVID-19 cases were discovered intermittently, illustrating the importance of judiciously managing the unit census, training staff in proper infection control techniques, and designating

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Table 1
Recommendations for managing infection control and maintaining meaningful psychiatric treatment on inpatient psychiatric units during the COVID-19 pandemic.

Recommendation	Details
1. Universal testing	As recently recommended by Bennet et al. [7], we recommend for universal testing to all patients at pre-admission tests using both COVID-19 virus detection and antibodies to determine unit placement. This is an expansion on earlier recommendations by Li L [6] to limit testing to symptomatic patients to address high asymptomatic rates.
2. Cohort inpatient admissions based on infection status	Despite recommendations how to avoid COVID-19 spread in psychiatric units, challenges remain [6,7]. Therefore, where possible in areas in which COVID-19 is active, one or more designated COVID-19 positive inpatient psychiatric units should be established. This will allow for enhanced infection control procedures while preserving vital psychiatric evaluation and treatment. Ideally COVID-19 positive psychiatric units would be situated in or near general medical hospitals to facilitate ongoing medical consultation and rapid transfer to medicine if needed.
3. Designate person under investigation (PUI) space	As infection rate in your area increases, consider maintaining a room or set of rooms separated from other patients as a space for persons under investigation for COVID-19, as patients may initially test negative and then present with suggestive symptoms, requiring immediate isolation prior to test results and transfer.
4. Patient PPE and hygiene	Surgical masks should be provided for all patients with frequent instruction and encouragement of use, and regular reinforcement of social distancing and hand hygiene.
5. Clinical monitoring of inpatients	<u>All patients:</u> 1. Monitor vital signs, including oxygen saturation, at least twice daily to monitor for signs of infection in negative patients and for signs of clinical decompensation in positive patients. 2. Monitor for any signs or symptoms of illness, including new neurological symptoms or changes in mental status. <u>COVID-19 positive patients (mildly symptomatic or asymptomatic) on the cohort positive unit:</u> 1. Monitor basic labs (CBC, BMP, LFTs) and inflammatory markers (ferritin, LDH, D-dimer, CRP) every other day. 2. Increase frequency of patient observation consistently to Q15 minute checks, as patients are more likely to be isolated for longer periods. 3. Collaborate closely with the hospitalist and infectious disease teams. It is particularly helpful when medical consultants can be designated as liaisons to the psychiatric units as medical and infection control consultation is particularly valuable when well informed by the unique characteristics and needs of psychiatric units and patients with serious mental illness.
6. Staff PPE and hygiene	Staff members on psychiatric units are likely to be less familiar with PPE than staff on general medical units, and therefore training and regular re-training on PPE use as well as isolation precautions should be reinforced in advance of and during a pandemic. <u>Negative units:</u> 1. Face masks (N95 or surgical) and eye protection should be used for all staff when on the unit, gloves when in direct physical contact with patients. <u>Cohort COVID-19 positive units:</u> 1. Full PPE for all staff when on unit (gown, gloves, N95, face shield, hair cover, booties) and training and retraining staff on use of PPE and isolation precautions. 2. Staff use of scrubs, in addition to PPE, as means to maintain safe hygiene both at work and home. 3. Encourage frequent hand hygiene with sanitizer and hand-washing. 4. Use of PPE Portraits should be considered for all staff members in full PPE.
7. Staff monitoring	1. Temperature checks should be conducted twice daily with symptom monitoring for all staff. 2. Consider regular scheduled COVID-19 swab and antibody testing for all staff.
8. The COVID-19 positive unit milieu management	1. Consider maintaining a lower census when possible based on increased psychiatric and medical management needs of COVID-19 patients as well as to provide greater physical space on the unit to allow for distancing in patient bedrooms and in common areas, and minimal sharing of bathrooms. 2. Consider adjustments to staffing based on increased individualized care needs of patients. 3. All patient meals and snacks should be provided in their rooms, individually packed if possible. 4. All visiting on the unit should be suspended; limits should be placed on any nonessential persons on the unit. 5. Schedule phone and video visits for patients to connect with loved ones, multiple times per day, outside of therapy sessions. 6. Use telehealth, when possible, for individual assessment and treatment interventions, combined with in-person interactions. A combination of these (some staff live, some staff on tablet during assessment at the same time) allows for continued interdisciplinary team management of patient care. 7. Use telehealth to conduct family therapy sessions and discharge planning with patients and their significant others, offering psychoeducation regarding psychiatric and medical follow up recommendations, including potential isolation requirements. 8. Daily schedule should include opportunities for time out of room for leisure and TV/phone use, including outdoor time if available. 9. Staff should monitor areas to ensure distancing and use of surgical masks by patients and regular cleaning of surfaces (e.g., phones in between use). 10. Daily schedule with therapeutic groups, maximizing patient participation and motivating patients who were more isolated, as possible. • Limit group numbers based on safely distancing in group rooms, offer smaller groups more frequently in staggered fashion to accommodate census. • Balance mix of milieu therapeutic activities, including coping based skills groups and creative arts therapy groups. • Provide patients with individualized packets of therapeutic and leisure activities (mindfulness exercises, guided imagery, Sudoku, with safety pens) to use in their rooms. • Provide music choices for broadcast into patient rooms.
9. Contingency staffing	

(*continued on next page*)

Table 1 (*continued*)

Recommendation	Details
	1. Create and distribute a formal contingency plan for rotated staffing, as possible, with staff alternating working remotely to decrease staff exposure. 2. Clearly delineate staff responsibilities when on-site vs remote. 3. Have a clear plan for cross-coverage to and from other services if this becomes necessary due to staff being out sick or being deployed to other areas. 4. Communicate the rationale for staffing decisions on a regular basis and address issues of actual or perceived lack of fairness which can undermine staff morale.
10. Interdisciplinary and administrative cooperation	1. Regular frequent meetings should be scheduled with departmental and hospital leadership, including medicine, infection control and environmental management (initially 3-5× weekly, then at least 2× weekly) to anticipate and manage issues and reassess practices as conditions change. 2. Schedule regular, daily check-ins with environmental services to ensure daily "terminal" sanitizing of all common areas, including hallways, patient rooms and clinical offices. Scrupulous cleaning is essential both for infection control and to reassure staff and patients that they are protected.
11. Staff support	1. Conduct staff educational sessions, initially offered every shift, to review rapidly evolving infection control recommendations, ensure PPE protocol compliance, and address staff concerns and well-being. 2. Create formal and informal supervision meetings for staff to receive education about unit protocol and recommendations for building and maintaining therapeutic alliance with patients while interacting behind full PPE. 3. Allow opportunities for staff to provide input and voice concerns. 4. Support staff in their current work and assess and address burn out, anxiety and other challenges. 5. Encourage self-care; provide food and other 'gifts' to nurture staff and enhance morale during a challenging time. 6. Actively remind staff of resources for additional support (e.g., mental health services and assistance with transportation, meals, childcare and temporary housing).

space for persons under investigation (PUI) for COVID-19. PUI found to be positive on Unit B were transferred to Unit A, and the census on Unit B was capped at 31 of the 33 total beds, leaving two beds open when the need for isolation of PUI arose.

As of July 2020, both units became COVID-19 negative. These protocols are now available to be reinstituted rapidly in the event of a second COVID-19 wave in the fall and winter or subsequent pandemics.

4. Recommendations

Our recommendations are listed in Table 1. Similarly to Barnett et al., we recommend universal testing, PUI assessments and working closely with the hospital administration to "keep infection out" [7]. Here we expand to include the management of COVID-19 positive units based on our live experience.

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