

Health System Compartment Hardening for COVID-19

In thinking about coronavirus prep from the perspective of the basic compartments of the healthcare system – patients, facility, and staff, it is believed that if we can harden these three compartments we can avoid overwhelming surge and mitigate impact. Idea is to combine this with non-pharmaceutical interventions in community (social distancing, school closure etc.) to deaden impact and create resilience in health system.

Hospitals should be dusting off their pandemic plans from 2007-2009, ripping out pages that aren't relevant (vaccine and antivirals) and starting prep. Healthcare cooperation is going to be a big factor in outcome. Below is a good checklist of some (prob not all) things to do in the 3 compartments. Thinking about this a starting point that can be adapted for your organization and membership.

Patient hardening – Create more resilient patients insulated from risk of transmission (especially the elderly >65 y/o and those with underlying comorbidities such as heart, lung, kidney disease; diabetes, etc.) Actions include:

- Provide additional prescription meds to for 2-3 months supply for every patient if possible; eliminate co-pay penalties and insurance restrictions for longer supplies
- Utilize mail-order or other remote refill mechanism for patients who cannot get large stockpiles (narcotics etc.) that doesn't require in-person visit.
- Move up to immediate semi-elective surgeries and procedures (those that can avoid complications and will need to be done in the next 6 months) to get these off the table.
- Continue purely elective surgeries/procedures/admissions until triggers indicate time to commence non-pharmaceutical interventions (NPI) in that community and then cease until epidemic wave passes and health system unloads.
- Tune up complicated patients as best as can be over the next several weeks to allow "cruise control" for 2-3 months without accessing health care in person
- Ensure people are up to date on flu shots and pneumococcal vaccines.
- Strengthen internet and telehealth communications between patients and healthcare systems so patients can get advice and care while remaining at home, e.g. nurse advice lines, new smartphone apps and web-based portals, etc.
- Augment home health services for most vulnerable and fragile (must insure proficient infection prevention and control skills in home-health personnel)
- Facilitate disease specific social network and support groups (i.e. diabetes group) where healthcare providers and experienced patients can share lessons, insight, and support
- Engage family members and social support systems to prepare vulnerable patients to shelter in place for a 1-2 months.

Facility hardening – To ensure the continued functioning of the healthcare system, protect patients and staff from nosocomial spread, and absorb a large surge of severe respiratory disease, hospitals and other healthcare facilities must act now. Skilled nursing facilities (SNFs), dialysis clinics, cardiac rehab, and other facilities with high concentrations of especially vulnerable patients should make special preparations. Actions include:

- Outpatient clinics, ERs, acute care clinics etc. should initiate parallel/separated triage lines for influenza-like illness (ILI)/upper respiratory infection (URI) patients that do not cross streams with non-ILI/URI immediately.
- Admission screening should occur for all elective or non-acute infectious disease admissions.

- URI/ILI should be identified and either cared for at a remote site for non-serious or cohort in separate area with dedicated staff.
- Hospital systems, clinics, etc. should work with state/local public health labs, commercial labs, and academic reference labs to get testing protocols in place as diagnostic availability ramps up
- Ward cohort should start immediately – admissions with pneumonia should be cohorted with dedicated wards and staff that do not mix
- Outpatient practices should consider engaging home visit/home care options starting now to defer visits.
- ERs and outpatient clinics should engage telehealth resources for acute issue triage, follow-ups, med refills, etc. to defer visits to clinics or ERs.
- Health plans and health departments should activate protocol driven advice lines.
- Facilities should start expanding inventories of all major drugs and consumables supply stocks to be able to absorb interruptions of supply chain, but avoid excessive hoarding
- Arrange alternate suppliers for critical supplies in case of shortages
- Renovation/construction projects that may interrupt workflow or space capacity should be delayed or adjusted.
- Put in place the conserve/reuse/recycle approach for critical supplies such as PPE
- Strengthen tele-education and tele-ICU arrangements, so ICU's can get remote help and support when overwhelmed - identify remote providers now and practice systems
- Develop alternate sites of care for hospital ward expansion, including on and off-site options with surge to 5-10x normal number of pneumonia and influenza admissions at peak flu season
- Engage private sector partners to assist in supply and logistics chain strengthening/back up, transportation, communication, surge space, and other critical needs.
- Hospitals and health systems must create regional coordination through healthcare coalitions or other mechanism (healthcare emergency operations center) that uses Incident Command System (ICS) and maintains visibility of essential supply chains, patient load and distribution, resource sharing, transportation assets, private sector partners.
- Consider enhanced EMS/paramedic scope of practice for remote case management

Staff hardening – Health systems depend on staff who are healthy, unconstrained by home needs or illness or economic burden, and confident of their skills and safety while at work. Employers should take immediate action to do the following:

- Address personal medical conditions of HCW staff and provide 2-3-month supply of meds.
- Address family member medical issues and med supply to avoid staff distraction.
- Assess family support resources that should be made available for HCW planning – elder care, child care, dog walking, family meals for lower income, etc. and facilitate these services.
- Hire and train additional staff, engage locums and travel nurses to supplement ward staff
- Academic medical centers should provide additional IPC and skills training for medical, nursing, and allied health students to enable to provide care and support hospital key functions
- Coordinate with regional partners and assemble volunteer staff lists of retirees, non-practicing, and other health care professionals
- Cross-train professionals for out of scope practice – dentists, pharmacists, etc.
- Accelerate education and training for appropriate IPC practices and PPE use
- Provide paid furlough or alternate duties away from high-contact environments for staff with significant risk factors
- Implement paid sick leave protocols for low wage workers on contracts

- Examine options for rotating blocks of staff (i.e. 5 on q12, 5 quarantine, 5 off)
- Provide hotel option for staff who do not feel comfortable sharing home with loved ones

Vulnerable populations – fatality data from China CDC

COVID-19 Mortality Stats		COVID-19 Fatality Rate by COMORBIDITY:	
COVID-19 Fatality Rate by AGE:		PRE-EXISTING CONDITION	DEATH RATE
AGE	DEATH RATE	Cardiovascular disease	10.5%
80+ years old	14.8%	Diabetes	7.3%
70-79 years old	8.0%	Chronic respiratory disease	6.3%
60-69 years old	3.6%	Hypertension	6.0%
50-59 years old	1.3%	Cancer	5.6%
40-49 years old	0.4%	<i>no pre-existing conditions</i>	0.9%
30-39 years old	0.2%		
20-29 years old	0.2%		
10-19 years old	0.2%		
0-9 years old	no fatalities		