



Infection Control Preparedness Planning for SARS

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Planning Goal

- Protect the healthcare community from SARS
 - Patients
 - Healthcare Workers (HCWs)
 - Visitors



SARS Preparedness Planning

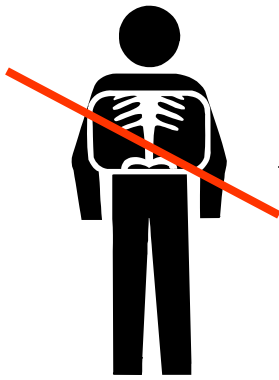
- Preparedness Plan Elements
 - Organizational infrastructure
 - Logistics of patient care
 - Staffing
 - Durable and consumable resources
 - Exposure management
- Patient focused pre-event planning
 - Lessons learned
 - Fix the weaknesses in the system



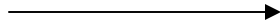
Lessons Learned: Case Study #1

Toronto Hospital Emergency Department

- Patient contacts as SARS transmission risks
- Evidence for close contact/droplet spread
- Implement precautions at point of first encounter



**Index Case
(Mother)**



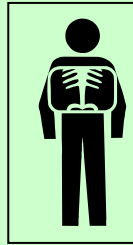
**Patient A
(Son)**



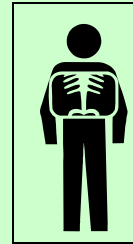
Admitted to SGH

Night of March 7th

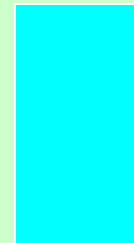
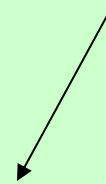
Observation Unit ER SGH



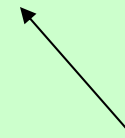
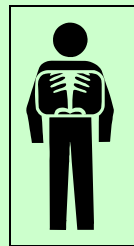
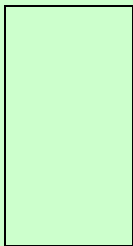
Patient A



Patient B



Patient C



Toronto Hospital Emergency Department March 16; 22:45-23:30





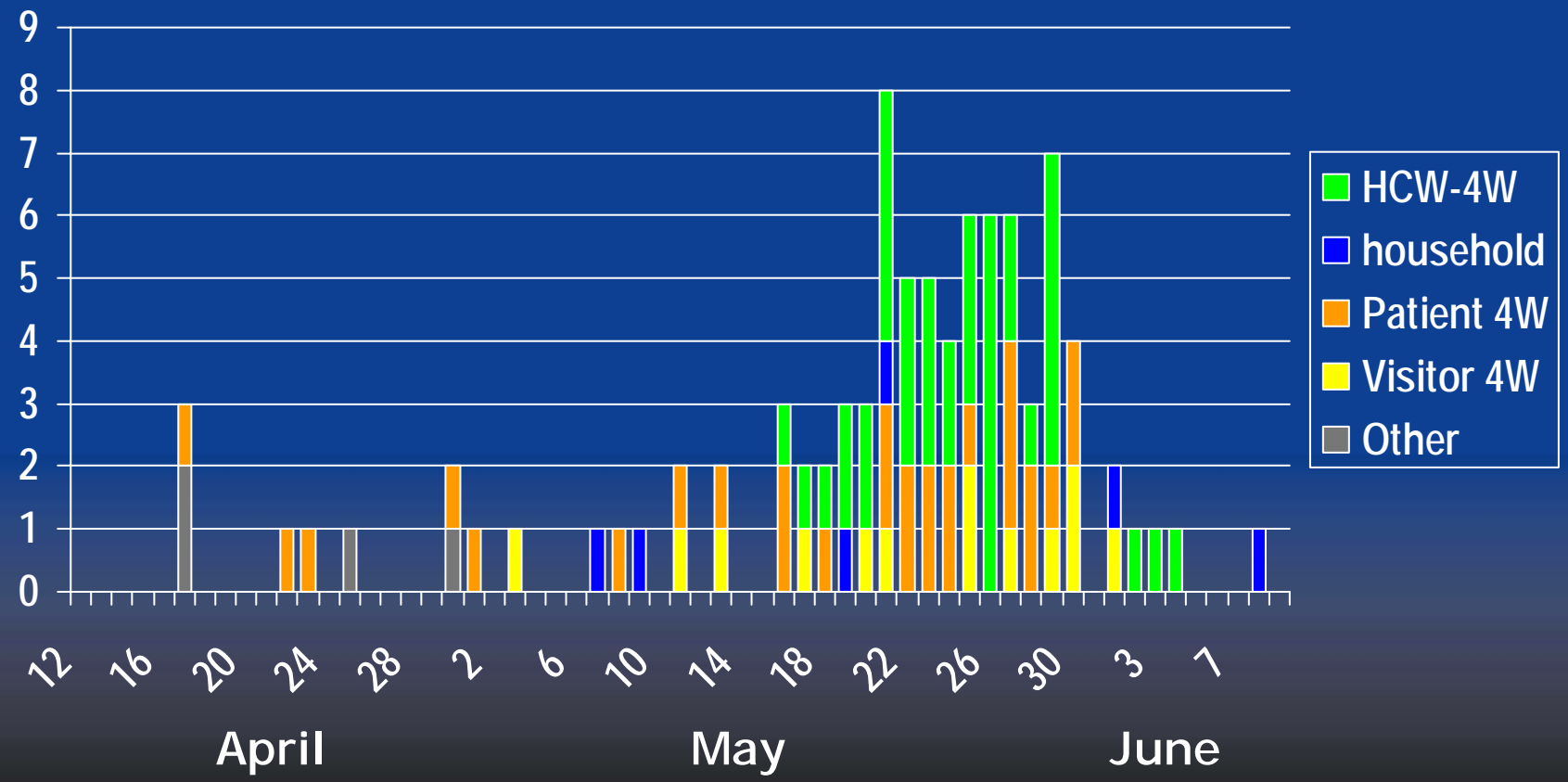
Lessons Learned: Case Study #2

Toronto Outbreak: Phase II

- Barrier precautions are protective
- Maintain vigilance after outbreak is “over”



SARS 2 - NYGH





Lessons Learned: Case Study # 3

SARS Transmission During Aerosol-Generating Procedures

- Risk of transmission may be heightened during aerosol-generating procedures
- Importance of using full barrier precautions and careful use of PPE



Communicability is heterogeneous: aerosol-generating medical procedures



- **Cluster of Severe Acute Respiratory Syndrome Cases Among Protected Healthcare Workers ---
Toronto, Canada, April 2003**
 - Canadian family physician
 - April 4: Onset of symptoms
 - April 13: ICU
 - Non-invasive positive pressure ventilation (BiPAP)
 - Intubation (assist-control ventilation)
 - Frothy secretions that obstructed ventilator tubing, requiring disconnection and drainage
 - Switched to high-frequency oscillatory ventilation for 7 days



TABLE. Characteristics of 11 health-care workers who developed symptoms of Severe Acute Respiratory Syndrome (SARS) following exposure to the index patient during the time of his intubation — Toronto, April 15–18, 2003

Health-care worker	Symptom onset date	Suspect or probable SARS case	Occupation	Exposure
1	April 15	Suspect	Respiratory therapist	Provided care before, during, and after intubation in ICU*
2	April 16	Suspect	ICU nurse assigned primarily to another patient	Provided care before, during, and after intubation in ICU
3	April 16	Suspect	ICU primary nurse	Provided care before, during, and after intubation in ICU
4	April 16	Suspect	Respiratory therapist	Provided care before, during, and after intubation in ICU
5	April 16	Probable	Ward physician	Examined patient on ward during morning of April 13
6	April 17	Probable	ICU physician	Provided care before, during, and after intubation in ICU
7	April 17	Suspect	ICU charge nurse	Provided care before, during, and after intubation in ICU
8	April 18	Suspect	ICU physician	Examined patient on ward during early morning of April 13
9	April 18	Suspect	Radiology technician	Performed chest X-ray of patient on ward during early morning of April 13
10	April 18	Not a case [†]	ICU nurse assigned primarily to another patient	Provided care after intubation in ICU
11	April 21	Not a case [§]	ICU physician	Provided care before intubation in ICU

* Intensive care unit.

[†] Illness marked by headache, cough, and diarrhea but without fever.

[§] Illness marked by cough and infiltrate on chest radiograph but without fever.



What have we learned?

- SARS transmission
 - Primarily through close contact with infected persons
 - Droplet spread most likely
 - Cannot rule out fomites and possibility of airborne spread
 - Intensity of exposure during aerosol-generating procedures may increase transmission risks



What have we learned?

- SARS transmission risks are primarily from:
 - Unprotected exposures to unrecognized cases in both inpatient and outpatient settings.
- We must look beyond the patient ... contacts may be infectious too.
- Prevention begins when a patient or visitor walks through the door of an Emergency Department or outpatient office.



What have we learned?

- Use of PPE prevents transmission...however,
 - Healthcare personnel need instruction on how to don, use and remove PPE
 - Wearing PPE for extended periods of time is a burden and can lead to breaches in technique



What have we learned?

- Cohorting groups of patients that require airborne isolation is challenging but can be done
- Advance planning is necessary to ensure the protection of HCWs, patients and visitors



What should be our immediate priorities?

- Improve recognition and prevention of transmission at the initial point of patient encounter
- Improve PPE use practices
- Review precautions for aerosol-generating procedures



Act Now!

**Address Prevention Planning
Priorities in Emergency
Departments and Outpatient
Offices**



What would happen today if a patient with symptoms of SARS presented to your Emergency Department or outpatient office?



Opportunities for Prevention Intervention in Emergency Departments and Outpatient Offices

- Triage and reception encounter
- Waiting room encounter
- Evaluation by the healthcare provider
- Transport (e.g., to radiology)
- Respiratory treatment
- Hospital admission process



Prepare to make changes at the first point of patient encounter

- Examine your triage, reception and appointment procedures
 - Are patients queried about respiratory symptoms?
 - Are personnel trained to observe for respiratory symptoms in patients and visitors?
 - What instructions are provided to patients who are symptomatic?




Prepare to make changes at the first point of patient encounter

- Consider ways to prevent exposures....
 - Visual alerts with instructions at entrances
 - Designate “sick” and “well” waiting areas
 - Create physical barriers between patients and triage/reception personnel
 - Promote “Respiratory Etiquette”



Promote “Respiratory Hygiene”



- Instruct ALL patients with respiratory symptoms to cover nose/mouth with tissue when coughing or sneezing
- Make hand hygiene products and tissues available in waiting areas
- Offer masks to symptomatic persons



Patient-Focused Pre-Event Planning: Emergency Departments and Outpatient Offices




- Patient examination by the healthcare provider
 - Where will the patient with respiratory symptoms be examined?
 - What PPE will the provider wear?




Assess Airborne Isolation Capacity in Emergency Departments and Outpatient Areas


- Is there an airborne isolation room available for the initial patient examination?
- If not, what room or area would be appropriate for the initial examination of a patient with symptoms of SARS?
 - Distance from other examination rooms
 - Ability to redirect air flow




Assess Current PPE Practices in Emergency Departments and Outpatient Offices



- Assess availability of PPE
 - Are gowns, gloves, respirators or surgical masks, and face/eye protection available?
 - Are N95 respirators available and have staff been fit-tested?
- Review PPE use with healthcare providers
- Reinforce importance of hand hygiene



Patient-Focused Pre-Event Planning: Emergency Departments and Outpatient Offices



- Transport of patient for diagnostic procedures, treatment, admission
 - How will the patient be transported?
 - Who will be responsible?
- Hospital admission (if necessary)
 - Who needs to be notified?
 - Infection Control
 - Health Department
 - Receiving patient care unit



Act Now!

Address Prevention Planning
Priorities in Hospitals



What would happen today if a SARS patient is admitted to my hospital?



Patient-Focused Pre-Event Planning:Hospitals

- Where will the patient be isolated?
- How will we move the patient through the admissions process to the isolation room?
- Who will care for the patient? Have they been trained?



Patient-Focused Pre-Event Planning:Hospitals

- What if the patient needs to be placed on a ventilator?
 - Who will do it?
 - Where will it be done?
 - What PPE will be worn?
- How will family members and other contacts be managed?
- Who needs to be in the communication loop?
- What if there is an exposure?
- Is there a procedure that tells me what to do?



What would happen today if I learned that a patient who has been hospitalized for one week has been diagnosed with SARS?



Patient-Focused Pre-Event Planning: Hospitals

- Is the patient isolated? If not, where should he/she be placed?
- Does anyone else have symptoms of SARS? How would I find out?
- Who has been exposed? How would I find out?
 - HCWs?
 - Other Patients?
 - Visitors?
- What should we do with exposed persons?



Act Now!!! Test the System!

- Develop “SARS Patient” scenarios for your work area
- Test them out to identify and correct problems



Organizational Planning: Create the Infrastructure to Detect and Respond to SARS



SARS Preparedness Planning: Areas of Overlap with Disaster, Bioterrorism and Pandemic Influenza Planning

- Preparedness Plan Elements
 - Organizational infrastructure
 - Logistics of patient care
 - Staffing
 - Durable and consumable resources
 - Exposure management



Creating the Organizational Infrastructure

- Multi-disciplinary team
 - Scientific leadership – healthcare epidemiology/infection control
 - Administrative leadership
 - Clinical representation
 - Engineering/Environmental Services
 - Communications/public relations
 - Safety/security
 - Other



Creating the Organizational Infrastructure

- Collaboration with community and public health planning groups
 - State and local health department
 - Disaster preparedness planning groups
 - Healthcare facility planning groups



Creating the Organizational Infrastructure

- Creation of internal and external communication channels...*solidify these NOW!!*
 - Health department contacts
 - Chain of internal communication
 - Responsibility for media communications
 - Scientific spokesperson



Patient Admission Planning

- Identify areas that will be used for the care of SARS patients
- Decide how patients will be cohorted
 - Consider the need to segregate suspect from probable cases
 - Exposed asymptomatic patients
- Involve engineering personnel in determining optimal locations for cohorting



Evaluate Existing Facility Design and Functioning

- Identify all airborne isolation rooms in facility - ensure proper functioning
- Identify area(s) that can be converted for airborne isolation...should be able to:
 - Seal off from other patient areas
 - Establish negative pressure relative to surrounding areas
 - Exhaust directly outside (≥ 25 ft from intake) or pass through HEPA filter
 - Supplement with portable HEPA or UV



Patient Admission Planning: Configuration of SARS Units

- Designate locations for:
 - PPE and other isolation supplies
 - Waste and linen receptacles
 - Soiled equipment/PPE receptacles
- Assign responsibility for restocking isolation units and removing waste/ linen
- Assign responsibility for reprocessing reusable PPE (e.g., goggles)



Patient Admission Planning: Configuration of SARS Units

- Determine how to restrict traffic flow
 - Consider placing physical barriers and visual alerts
- Establish designated work patterns when moving within unit to limit contamination
- Train personnel on these procedures!



Environmental Cleaning and Disinfection

- Assess staffing needs to meet requirements for daily and terminal cleaning of SARS patient rooms or units
- Consider dedicating specially trained staff for this assignment
- Review current room cleaning protocols



Develop Plans for Educating and Training Healthcare Personnel

- “SARS 101” for clinical and support staff
- Training on Isolation practices
 - PPE use -demonstration of competency?
 - Isolation practices in a SARS unit
- Plan for caring for SARS patients
- Specialized training?
 - Designated SARS care teams
 - Aerosol-generating procedures teams
 - Designated environmental services personnel
- Respirator fit-testing and training



Provide Informational and Instructional Materials

- Posters on PPE use and Hand Hygiene
- Patient and visitor information



Surveillance Planning

- Develop systems for:
 - Monitoring patient contacts
 - Surveillance for transmission to patients and personnel
 - Exposure reporting
 - HCW exposure management
 - Symptom monitoring
 - Work furlough



Planning for Surge Capacity



What is “Surge Capacity” for SARS?



Surge Capacity Planning

- Assessment of human resource needs
- Assessment of durable and consumable resource needs
- Logistics of patient triage, evaluation, admission, discharge, transfer



Surge Capacity Planning

- Control of traffic into and out of facility
- Ramp up of education and training



Surge Capacity Planning: Human Resource Needs

- Number and categories of healthcare personnel required to provide SARS care for multiple patients
 - Establish policies regarding students and trainees
 - Consider need for “PPE breaks”
 - Consider how temporary staffing needs will be met if existing resources are exceeded



Surge Capacity Planning: Consumable and Durable Resources

- Consumable resources
 - PPE supply needs per patient/day
 - Mechanisms for meeting increased demand for supplies
 - Contingency plans for limited resources
- Durable resources
 - Respiratory support equipment
 - Patient-dedicated equipment



Surge Capacity Planning: Limiting Hospital Contact

- Restricted entrances
 - Fever screening on entry
- Visitor limitations
- Segregated areas for SARS and non-SARS staff?
 - Is it necessary?
 - What are the implications?



Surge Capacity Planning: Mental/Social Service Support for Staff

- Mental health counseling
- Family services
 - Child care
 - Shopping services (food, pharmacy, etc)
 - Transportation
- Lodging
- Economic support



Is the plan working?



Monitor for Adherence

- Identify criteria and methods for measuring adherence and effectiveness of interventions
- Areas to monitor
 - Patient placement
 - Surveillance for transmission
 - Use of PPE



Final Thoughts

- SARS transmission can be prevented!
- Begin NOW to prepare for SARS
 - Shore up procedures for triage and evaluation
 - Review use of PPE
 - Review precautions for aerosol-generating procedures
 - Solidify relationships with health departments
 - Engage your colleagues in preparedness planning



Infection control is
EVERYONE'S
responsibility!