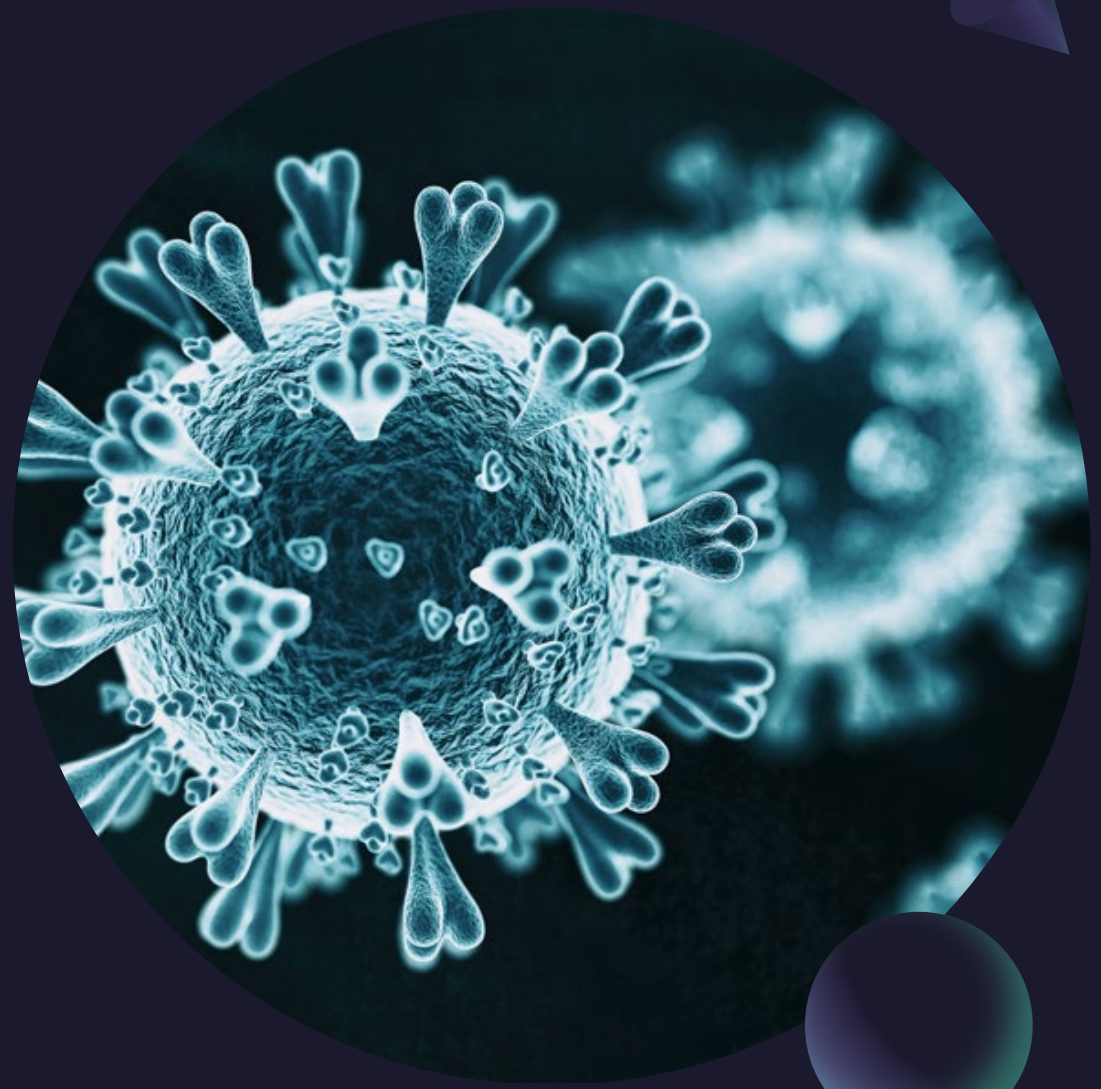
Preventing Exposure to Infectious Respiratory Aerosols

The Big Picture



Health and Safety COVID-19 Program Elements

- Authority & Responsibility
- Identification & Evaluation of Hazards
  - Exposure Assessment (control banding or similar)
  - Employee Participation
- Hazard Controls
- Training
- Managing Cases
  - Investigation, Response, Reporting
- Recordkeeping

All disease transmission routes are possible for COVID-19, but some are more likely

Contact

- Transfer from infectious source or object to mucous membrane

Droplet

- Large droplets >5um "propelled" onto face and mucus membranes (no inhalation)

Airborne

- Droplet nuclei inhaled ONLY when susceptible person is far from infectious source

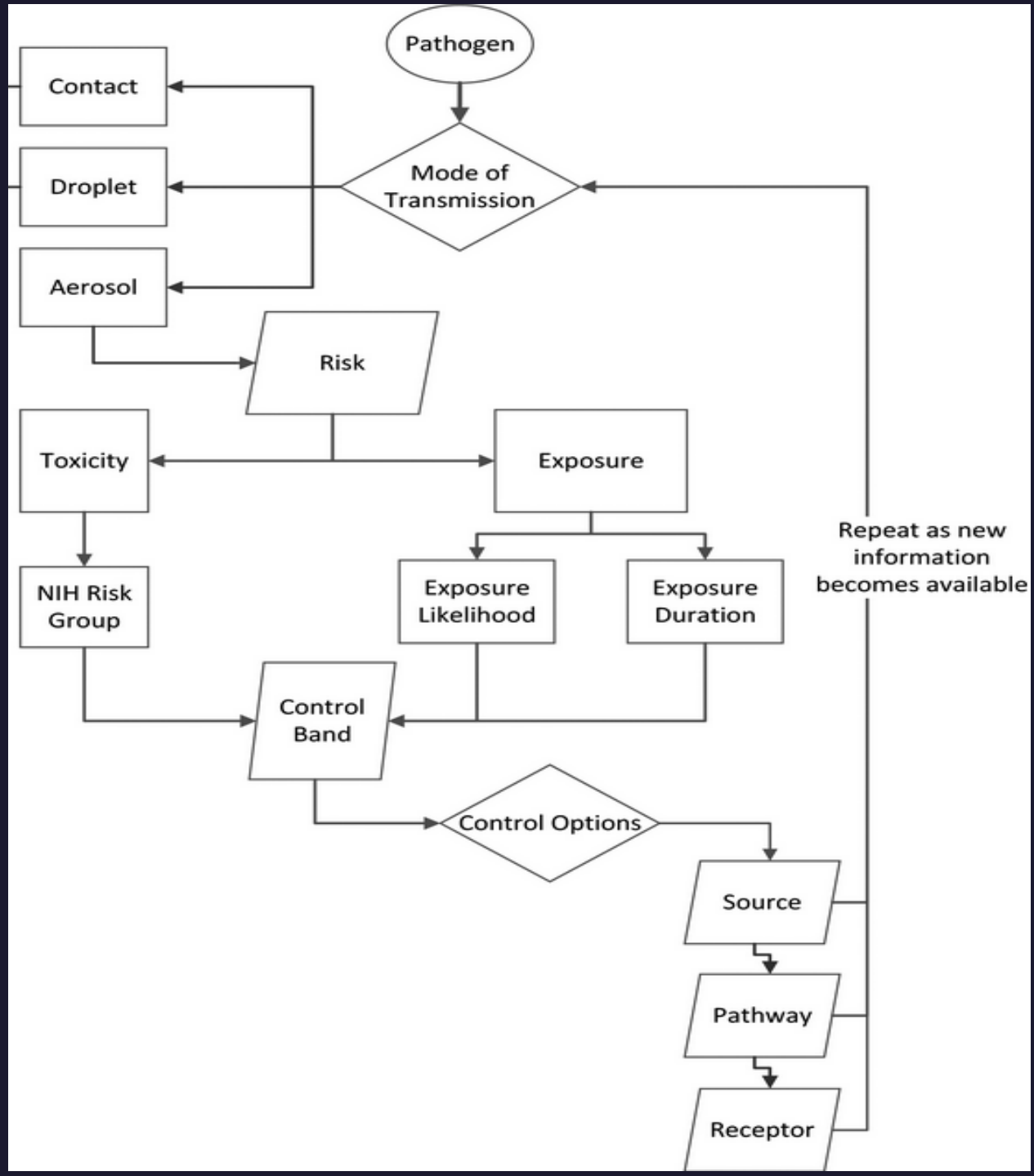
Aerosol

- Aerosols inhaled near the source

Control Banding Flow Chart

Goals:

- Identify which employees and jobs are at highest risk
- Prioritize controls and resources for those at highest risk
- Identify the best set of controls that eliminate or minimize exposures



Exposure = Likelihood * Duration

Likelihood	Daily Duration		
	D1 (0-3 hours)	D2 (3-6 hours)	D3 (>6 hours)
L1 (Unlikely Exposure)	E1	E1	E1
L2 (Possible Exposure)	E2	E2	E3
L3 (Likely Exposure)	E2	E3	E3

Aim to Lower Exposure Level

Goal:

Reduce exposure to E1 levels by selecting additional control strategies from the source and pathway categories and reducing reliance on PPE

Band	Control Options
A	Source – Do these first! Pathway – May be prudent Receptor – Not necessary
B	Source – Do these first! May require multiple options Pathway – Do these next & may require multiple options Receptor – Only if source and pathway controls are not effective
C	Source – Do these first! May require multiple options Pathway – Do these next & may require multiple options Receptor - May be prudent

Source Controls for Hazardous Aerosols

Elimination

- Screening for symptoms & other risk factors
- Testing for infection
- Exclude and quarantine
- Work from home

Substitution

- Job re-design

Isolation (remove sources & lower concentration)

- Increase distance (but 6 feet is not a magic number)
- Decrease density (fewer people = fewer sources)
- Shorter shifts
- Job re-design

Pathway Controls For Hazardous Aerosols

Dilution ventilation

- Won’t eliminate exposure near a source

Local exhaust ventilation

- Portable air cleaners

Barriers

- Could change air flow patterns and dilution
- Could result in high particle concentrations
- Could introduce new or exacerbate current hazards – ergonomics, communication, isolation, stress
- Might have unexpected and unwanted effects on particle movement

Warehouse Worker

- Frequent face-to-face discussions
- Constant contact with others
- Working in Groups or teams
- **Works** 3-6 **hr per day** since some of the shift probably involves working on one's own

Exposure Level

Likelihood	Daily Duration		
	D1 (0-3 hours)	D2 (3-6 hours)	D3 (>6 hours)
L1 (Unlikely Exposure)	E1	E1	E1
L2 (Possible Exposure)	E2	E2	E3
L3 (Likely Exposure)	E2	E3	E3

	Risk Rank			
Exposure Rank	R1	R2	R3	R4
E1	A	A	A	B
E2	A	B	B	C
E3	A	B	C	C

Control Band C Requires Multiple Source and Pathway and Likely Receptor Controls

Source Controls

- Frequent testing, paid leave
- Change work to limit # or length of contacts with co-workers
- Create separate work areas

Pathway Controls

- Improve dilution or local ventilation

Receptor Controls

- Respirators (if necessary)

Basic Principles for Controlling a New Workplace Hazard

Conduct a thorough workplace hazard assessment, adding COVID-19 to the mix

Don’t neglect any current hazards

Don’t introduce new hazards

Rely on source and pathway controls

Eliminate need for respiratory protection (no face coverings or surgical masks)

Use modeling and measurement whenever possible, to evaluate the effectiveness of controls