



JOHNS HOPKINS UNIVERSITY

***DEPARTMENT OF RADIATION ONCOLOGY & MOLECULAR RADIATION SCIENCES
SCHOOL OF MEDICINE***

An Integrated Program in a Pandemic:

Johns Hopkins Hospital
Bayview Hospital
Green Spring Station
Sibley Memorial Hospital
Suburban Rockledge Site

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intranet.radonc.jhmi.edu

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Contents

1. Overview	3
2. Purpose.....	3
3. Notifications	3
4. Emergency Call Trees.....	3
5. Visitors	3
6. Social Distancing in Clinical Areas	4
7. Staffing/Work from Home	4
8. Patient Appointments	5
Telemedicine	5
Follow Ups	6
Consults	6
Telephone Consents	7
9. Priority Scales by Disease Site	8
10. Screening.....	13
11. Testing	15
12. Staff Protection	17
13. Treatments	22
Management of Persons Under Investigation (PUI)	22
Management of COVID+ Outpatients.....	23
Admitted Patient	26
14. Device Management	28
15. Molecular Radiation Sciences (MRS).....	32
16. General Links and Resources	36
Appendix A. Breast Radiation	39
Appendix B. Head and Neck Radiation	42
Appendix C. Sibley Workflow Diagram for Treating an Outpatient COVID+ Patient or PUI	46
References	47

1. Overview

While our top priority remains the safety of our patients and staff, we continue to reach our goal of offering appropriate oncologic treatment to our patients during this time. Our priority is on social distancing, appropriate protective practices, and prioritization of patient needs. While we continue to follow the general policies of the institution and procedures of the department, we recognize short term changes in workflows are necessary in order to maximize the safety of our patients.

2. Purpose

The presence of the COVID-19 outbreak in the U.S. requires a structured response across our integrated network of radiation oncology facilities in Maryland and the District of Columbia. Though each hospital sets some aspects of these policies, our radiation oncology program will have a unified set of procedures and practices.

3. Notifications

- a. Department leadership, including managers and clinical directors for each site, will participate in a “Radiation Oncology Command Center” discussion at 5PM daily.
- b. A system-wide “COVID Huddle” video-conference occurs daily at 12PM; any department member can ask questions and receive updates on the issue at hand.

4. Emergency Call Trees

All emergency call notification trees have updated phone numbers listed. This is posted on the intranet.radonc.jhmi.edu ‘Pandemic Program’

5. Visitors

- a. Patient visitors: As of March 23rd, no visitors are allowed with a patient in the clinic. No visitors are allowed under the age of 18. Other family members or friends will not be allowed to enter the facility or to wait in lobbies or common areas. This includes all areas of the facility — the lobby, waiting areas and common spaces, chapels, cafeteria, or any other area within the hospital or medical center. Visitors with respiratory symptoms are being asked to stay home and away from clinical areas. Please refer to the system emails for entrance closures and additional restrictions. Rare exceptions are being made in extreme cases where patients need caregivers to be able to function due to cognitive and physical limitations; those caregivers are required to stay in the main lobby when not actively assisting patient.
- b. Corporate/outside visitors – all corporate, research, visiting professor or other work-related outside visitor meetings will be conducted via online visit or postponed indefinitely.

Visitor Guidelines

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_25_visitors_outpatient_cancer_centers.pdf

6. Social Distancing in Clinical Areas

- a. Waiting rooms should have chairs moved to have at least 1 meter between them.
- b. Patients waiting in lines should stand at a minimum 1 m between each other.
- c. All meetings should be converted to online rather than in person.
- d. Multidisciplinary clinics and tumor will convert to online, remote platforms. Patients may be seen by each provider individually.
- e. All break rooms are to have chairs separated by at least 6 feet. Shared food areas (coffee machine, refrigerator) will be closed.

Krames Education on Social Distancing and Self Quarantine

<http://johnshopkinsibportal.staywellsolutionsonline.com/Search/22,1307>

Please Do Not Visit If Sick Signage

https://intranet.insidehopkinsmedicine.org/heic/docs/do_not_visit_if_sick_signage.pdf

7. Staffing/Work from Home

- a. As of Monday March 16th, all public schools in Maryland and DC will be closed for an indeterminate period of time. Other schools and daycare centers have also independently made a decision to close for varying periods of time or will be on spring break next week. Please work with your manager to predetermine possible absences so that we can consider options for filling gaps. Please send staff call outs daily by 8:30am to Kelli Gress and Jenn Wieworka.
- b. As of 3/23, the Y in Central Maryland will be providing daycare services for the children of health care workers at no cost to parents. This is first come, first served and slots are limited - so please encourage your employees to sign up quickly if they need it. An email was sent to employees earlier today with information on how to request the service.
- c. Residents on research year, or on a non-clinical day for their service (i.e., days in which there are no scheduled consults, follow-ups, or OTVs) are asked to work from home at this time. If requested, residents should remain available for call in for other parts of the hospital in shortage situations. Research residents working from home may also be asked to help service residents with clinical responsibilities or in other capacities in our department if needed due to shortages. Residents are asked to attend clinic only at their primary hospital site (i.e., residents who are at EB the majority of the time for a given service will not travel to another non-EB clinic) at this time. Residents will remain responsible for clinic visit preparations and contouring at the non-primary site, at the

discretion of the attending. Residents are to remain available for possible assistance to the institution as a whole (rounding on inpatient services in oncology, etc).

- d. Dosimetry and physics will work on a rotation schedule organized by your manager to ensure adequate clinical coverage at all sites and back-ups for shortages.
- e. Managers in each discipline are working to minimize the number of clinical workforce members on site at a given time. Unless otherwise designated, clinical staff are expected to be on site, and if working remotely, must be available to come in and may be re-assigned roles based on shortages/needs for coverage.
- f. Faculty who are not in clinic are encouraged to work from home but at this time we ask all to be clinically available for call in the event of shortage situations.
- g. Due to staffing needs, departments may no longer be able to honor previously-approved vacation time. Please check with your supervisor before taking scheduled time off.
- h. Parking spots have opened up on the EB sites. Please contact your manager to obtain a parking spot during this time. The Weinberg garage remains restricted to patients only.

Resources:

Childcare needs

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_16.pdf

8. Patient Appointments

Telemedicine

- a. Telemedicine training for all MDs and NPs should be completed by 3/20/20. Routine follow ups may be handled through the telemedicine portal based on the physicians' judgement. As of 3/17, Telemedicine is the preferred mode for follow ups for all patients that have mychart, suitable IT or telephone infrastructure at home, and are sitting in Maryland or D.C. Once this has been determined, please reach out to your patients to set them up with a televisit in Epic with either video or phone permissible. Though new patient consults may be initiated on video visit, the need for examination requires in person care – the timing of the examination again will be at the physician's discretion and may be delayed to the date of simulation for those initially seen on a video visit. The MD must ensure that the patient is **sitting in a state in which the physician is licensed** or in D.C. for an established patients before initiating the call.
- b. Though DC has created a waiver to the licensure restriction, this is only for established patients, and new inpatient consults, not new outpatient consults.
- c. Pennsylvania allows applications for limited licensure; please consider this if your practice entails seeing patients from PA.
- d. Virginia will accept telemedicine visits for Maryland licensed physicians in the setting of an established relationship or patients that have a referral from a VA physician, not self-referrals.

- e. All MDC/tumor boards are to convert to Zoom-based discussions rather than in-person interactions.

Telemedicine program

Intranet.radonc.jhmi.edu (teaching video, FAQs, etc.)

<https://intranet.insidehopkinsmedicine.org/telemedicine>

Telemedicine training document:

<https://livejohnshopkins.sharepoint.com/sites/epictraining/Epic%20Training%20Dropbox%20DocLib/Telemedicine%20Preparation%20for%20COVID.pdf>

<https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet>

Follow Ups

Effective Monday, March 16, 2020 we will be implementing a new process for routine follow up patients in an effort to minimize patient and staff exposures.

- a. Physicians and NPs will review their follow up schedule for the next 4 weeks.
- b. Physician/NP to review schedule and decide which patients must be seen, converted to a video visit (preferred approach) and which patient appointments can be delayed (per clinically appropriate decision making). Anyone older than 60, especially with hypertension, diabetes, cardiovascular disease, chronic respiratory disease are the most likely to succumb from COVID-19 and therefore should be preferentially moved to video visit or delayed.
- c. For patients who need to be seen: the front desk will contact the patient the day before their visit to screen them for respiratory symptoms/fever. If these symptoms are present, patient appointment will be deferred for 2 weeks and they will be referred to their PCP for consideration of testing.
- d. For patients from whom appointments are going to be delayed: the patient will be contacted by a nurse/MA and screened for any symptoms. Scripting will be provided.
- e. Patients on follow up should be grouped into low risk and high risk, and the low risk patients rescheduled to an appointment after the pandemic is over (>4-6 months). Again, Telemedicine follow up for high risk cases should be utilized as much as possible.
- f. If on screening any potentially concerning symptoms are identified, these will be discussed with the provider and a decision can be made regarding the timing of the appointment.
- g. Any patient appointment delays MUST be documented in EPIC through a telephone encounter, and labelled.

Consults

Priority should be made to see consults as televisits for patients in Maryland, D.C., DE, FL and VA. The SOM is working on a system for patients residing in other states.

Telephone Consents

During the time of the COVID-19 pandemic we have been given permission from JHM Legal department to obtain a telephone consent during a telemedicine visit on a competent patient.

To document this, the provider/team would complete the treatment consent as normal and review with the patient during the visit. A clinical staff member must be the witness for telephone consents, under the witness signature box there is a checkbox for

telephone consent that must be checked- the clinical staff member would still verify the identity of the patient, that the patient has had all of their questions answered to their satisfaction and is willing to approve the procedure and sign the witness box (this could be done after the provider talks with the patient).

In an effort to reduce vectors of transition I think that should be the end of the process for those who chose to consent during telemedicine consult visits, as it is an approved process.

However, it was discussed that we could print out this consent and have the patient sign and date and scan back in the updated consent into Mosaik at the time of SIM. Legally, these steps are not required, but they may make staff feel more comfortable.

Workflow for obtaining telephone consent:

- The provider and the witness calls the patient (witness for telephone consent must be MD, Nurse, Advance Practice Nurse, PA, or Clinical Technologist), they will review all of the information, and receive the patient's verbal consent.
- Select the **Telephone Consent** checkbox (must be done before signatures obtained)
- Provider and Witness sign the electronic consent- if working from separate computers both can sign separately as long as witness has:
 - Identified self to patient
 - Verified the identity of the person
 - Assures that the patient has had all of their questions answered to their satisfaction and is willing to give their consent
- Make small mark in the patient signature box so the document will mark as all three signatures collected.
- The electronic consent is stored in the Consent tab of Chart Review.
- Close the encounter
- The nurse or admin retrieves the document in Chart review, prints to PDF
- The saved consent is uploaded into Mosaik
- No additional signatures need to be collected on the consent- this meets the legal requirements of consent- **no need to get the patient signature at the time of SIM.**

9. Priority Scales by Disease Site

Attempts should be made to determine whether the risks of the pandemic infection outweigh the risks of delaying treatment for that individual patient at the time of consultation. It should be noted that a delay in instituting radiation treatment should be as short as possible. Evidence suggests that there may be no safe delay period, so the decision rests on an assessment of relative risks for an individual patient. Patients receiving care in 2 different centers (e.g. external beam at one and brachytherapy at another) should receive special consideration.

Patients will be prioritized for radiation treatment based on the following priority scale, which was adapted from a general framework outlined by Ontario Health-Cancer Care Ontario³:

Level 1 (Continue radiation)	Patients already on treatment at that onset of the COVID-19 pandemic will continue unless they become COVID-19 positive (COVID+)/person under investigation (PUI). Patients who convert to COVID+/PUI will be placed on a treatment break unless they meet other criteria for urgent treatment. This level allows treatment for emergency and urgent patients where alternative management to radiotherapy is not possible. Patients with highly symptomatic metastatic disease who are deemed by their physician to have a life expectancy of at least 3-6 months and those with rapidly progressing potentially curable cancer will be treated. Please refer to Table 1 for disease site specific criteria for Level 1
Level 2 (Short delay of radiation acceptable if needed)	Routine situations requiring radiotherapy. Within each disease site, specific recommendations have been made. Patients should be contacted at frequent intervals to ensure they have not progressed to Level 1.
Level 3 (Hold radiation)	It may be possible to delay these cases until the pandemic is over or omit radiation all together. These are patients with benign disease or patients amenable to other therapy first (systemic therapy, surgery, etc., when appropriate).

- Level 1 patients will be treated, as described in Table 1.
- Level 2 patients will follow a structure determined by the disease site team leader and may have a delay in the initiation of treatment if needed.
- Level 3 patients will receive a video consultation, with intervention delayed until after the pandemic has been cleared if appropriate.

	Level 1	Level 2	Level 3
Breast (Please see Supplement 1 for more detailed breast guidelines)	<ul style="list-style-type: none"> -Non-metastatic inflammatory breast cancer. -Locoregional disease progressing through chemotherapy. 	All other breast cancer not meeting Level 1 and 3.	Patients meeting CALBG/PRIME II criteria for omission of radiotherapy -ER+ DCIS for patients meeting criteria from RTOG 9804, particularly if they can take endocrine therapy.
Central nervous system (CNS)	<ul style="list-style-type: none"> -High Grade gliomas of brain and spine tumors. -Benign or other tumors causing or with immediate threat of progressive neurologic symptoms. 	<ul style="list-style-type: none"> -Symptomatic low grade glioma. -Cases where chemotherapy may permit for delay radiation. 	<ul style="list-style-type: none"> -Asymptomatic meningioma, pituitary adenoma, craniopharyngioma, pilocytic astrocytoma. -Asymptomatic low grade glioma after gross total resection. -Trigeminal neuralgia. -Schwannomas.
Gastrointestinal (GI)	<ul style="list-style-type: none"> -Curative-intent anal, esophageal, and gallbladder/bile duct cancers. -Curative-intent rectal cancer that is medically inoperable. 	Neoadjuvant/adjuvant pancreas and rectal cancer treatment courses.	None
Genitourinary (GU)	<ul style="list-style-type: none"> -Curative intent bladder cancers. - High grade prostate cancer not 	<ul style="list-style-type: none"> -All other curative intent prostate cancers. -Any cases of prostate cancer on androgen 	None

	<p>able to receive androgen deprivation.</p> <ul style="list-style-type: none"> -GU small cell carcinoma treated with curative intent. -Patients in middle of combined brachytherapy and external beam radiation therapy. 	<p>deprivation or low risk prostate cancer cases that have not yet started radiotherapy can be triaged to the bottom of the Level 2 patients.</p>	
Gynecologic	<ul style="list-style-type: none"> -Cervical cancer with severe bleeding. -Locally advanced vulvar or vaginal cancer causing severe pain. 	<ul style="list-style-type: none"> -Postoperative vulvar cancer. -Inoperable endometrial cancer. -Postoperative cervical cancer (can be delayed up to 8 weeks postoperatively). -After induction chemotherapy, postoperative endometrial cancer (4 week break allowed after chemotherapy). 	<p>Postoperative cases of endometrial cancer to be scheduled for induction chemotherapy or requiring vaginal brachytherapy alone (up to 4-8 weeks postoperatively).</p>
Head/Neck	<ul style="list-style-type: none"> -All curative cases where treatment with radiotherapy or concurrent chemoradiation is indicated. -High risk postoperative cases based on pathologic and intraoperative findings including recurrent well differentiated extrathyroidal carcinomas. 	<ul style="list-style-type: none"> - All curative cases where induction chemotherapy is deemed clinically appropriate. -Intermediate risk postoperative cases. -Low-grade unresectable salivary gland malignancies. -Recurrent parotid / skull base pleomorphic adenoma. -Medium to large Collaborative Ocular Melanoma Study (COMS) choroidal melanoma or symptomatic choroidal melanoma regardless of COMS criteria -Symptomatic or secretory paragangliomas 	<ul style="list-style-type: none"> -Keloids -Small COMS choroidal melanoma -Asymptomatic Glomus tumors -Slow growing small basal cell carcinoma with mild or no symptoms, in a patient age >70 years. -Asymptomatic cutaneous non-pigmented

		-Symptomatic cutaneous non-pigmented carcinomas or high risk postop cutaneous non-pigmented carcinomas	carcinomas located in low risk anatomic regions.
Lymphoma	Patients with high-grade lymphomas with severe or life-threatening symptoms.	-Consolidation therapy for high-grade lymphomas. -Most patients with low-grade lymphomas.	Remaining patients with low-grade lymphomas, to be assessed individually.
Palliative	<ul style="list-style-type: none"> -Cord compression from histology other than chemotherapy naïve small cell lung cancer or lymphoma and that are not amenable to surgical decompression -Symptomatic brain metastases not amenable to surgical decompression and/or brain metastases >5 mm from histologies not anticipated to respond to systemic therapy. -Malignant airways obstruction not amenable to surgical intervention/stenting. -SVC syndrome not amenable to thrombectomy/stenting -Acute hemorrhage from primary or metastatic disease not amenable to embolization/other direct intervention -Severe pain from primary or metastatic disease not responding to conservative measures 	<ul style="list-style-type: none"> -Painful spine metastasis without epidural extension or other immediate risk to the neuraxis -Spinal cord compression or spine metastases with epidural disease in patient with chemotherapy naïve small cell lung cancer or lymphoma who can receive chemotherapy. -Brain metastases <5 mm anticipated to be responsive to targeted agents or immunotherapy. -Other metastatic sites causing non-life threatening symptoms, particularly those which may respond to conservative measures (e.g., pain, shortness of breath stable on room air) 	

	-Heterotopic bone (at discretion of MD)		
Pediatrics	All curable cases where delay of radiation is not possible.	All cases where chemotherapy or other interventions can be safely used to delay initiation of radiotherapy.	All elective or non-essential radiation cases.
Sarcoma	-Palliation of extreme pain or uncontrolled bleeding.	All other neoadjuvant, adjuvant, and definitive cases.	None
Thoracic	-Limited-stage small cell lung cancer. -All patients with non-metastatic node-positive or rapidly proliferating node-negative thoracic tumors for which the (time-sensitive) goal is cure and where alternative management is not possible.	-Consolidation of oligo-metastatic and oligo-progressive lung cancer. -Stage I NSCLC. -Post-operative thoracic tumors w/o residual disease. -Pulmonary ground glass opacities without solid component	None

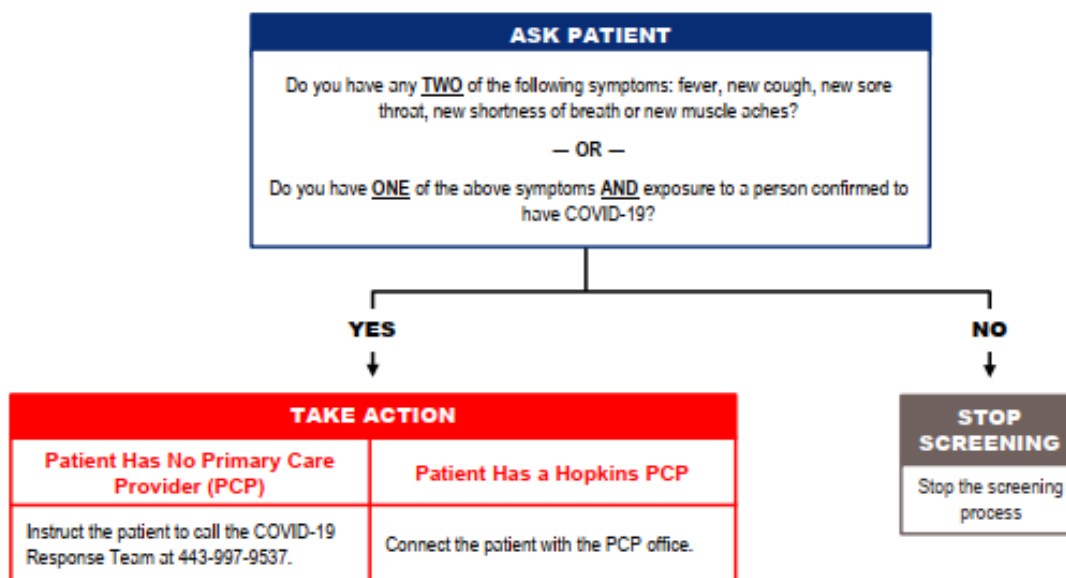
10. Screening

Overview

1. All visitors and patients are screened upon entry to the hospital/clinic for respiratory symptoms at the entrance.
2. Any **patients** who screen positive for respiratory symptoms but have not been tested for COVID-19 are placed in a mask and immediately brought to a designated exam room separate from other patients. Treatments are delivered with droplet and contact precautions and all surfaces are disinfected in any room the patient occupied after the patient episode is complete.
3. Patients who are awaiting test results (PUI) or have tested positive will be placed on break or managed according to the priority scale (Section 8).
4. We have asked patients to call ahead if they develop respiratory symptoms so that we can take appropriate infection control precautions. Nurses or support staff will be calling all patients prior to simulation, consult, and follow-up appointments with the following screening algorithm:

Ambulatory Phone Screening Algorithm for People Calling with Concerns about COVID-19

UPDATED MARCH 29, 2020 at 9:45 AM EST



All of our sites should continue with in-department screening. Kiosks are no longer screening patients.

1. Entrance

- a. East Baltimore: All patients and visitors will receive a wristband at the Weinberg 1st floor or main hospital entrance in East Baltimore.
 - i. The Lower Priority 2 doors from the garage to Radiation Oncology will be locked. All garage foot traffic will proceed to the other garage elevators with mandatory exit on the first floor to complete screening.
 - ii. Signs will be posted directing patients from the Weinberg garage to the first floor for screening.
- b. Sibley has instituted 'visitor pass' name badges once screened at the main entrance. Please check for these with patients in your clinics.
- c. Suburban, Green Spring Station (GSS), and Bayview are developing entrance screening. Please prepare for delays as patients may be late for appointments.
- d. Please ask patients to arrive 15 minutes before appointment to go thru the mandatory screening at the entrances.

2. In-department screening includes:

- a. Therapists checking in daily with patients and documenting in Mosaiq in the time out section; however, patients that already have a wrist band/badge from entrance screening do not need to be re-screened.
- b. Nurses will continue screening simulation patients one day prior to the visit by telephone and during OTVs; screening will be documented in Epic.
- c. Front desk staff will continue to screen patients coming in for consults and follow ups. Again, anyone who already has a wrist band does not need to be re-screened.
- d. The new patient referral office will continue screening new patients prior to booking.

3. Screening has changed to being symptom based (travel criteria was removed); see most recent guidelines here: [outpatient guideline algorithm](#).

4. Patients with two of the following symptoms: fever, acute onset cough, new shortness of breath, sore throat, or new muscle ache symptoms should be sent for testing and put on break from treatment or not started until tested negative. Management of patients who have been tested (PUI) and positive patients is addressed below.

- a. JHH testing center is in front of dome, which will help facilitate drive up testing.
- b. Suburban and GSS will have tents set up the week of 3/16/2020.
- c. Sibley's tent is up as up 3/23/2020 for ED patients and in-patients to be screened in (not a testing site).
- d. Bayview will have a tent in the ED parking lot only for ED overflow (it will not be a testing site).

Resources

People calling with concerns regarding screening

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_phone_triage.pdf

Occupational algorithm for employees

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_occupational_health_algorithm.pdf

Occupational Health Contacts

https://intranet.insidehopkinsmedicine.org/heic/docs/occupational_health_contacts.pdf

[Occupational Health Unified Number: \(443\) 287-8500](tel:(443)287-8500)

11. Testing

1. Only HEIC and an individual's primary physician should order testing, based on symptoms and circumstance. Test ordering and resulting is live in Epic for patients.
 - a. If you have come into contact with a colleague who has been asked to stay at home due to COVID-19 exposure and you are considered at high risk, please be reassured that that you will be contacted by HEIC and OHS. Do not order testing for yourself or one of your colleagues.
 - b. If the patient does not have a PCP, please call the triage line and they will direct you regarding next steps:
 - i. EB, Bayview and GSS 410-955-3333
 - ii. Sibley: contact the Incident Command Center
 - iii. Suburban: Emergency Department 301-896-3880
 - c. Radiation Oncology will not be offering COVID-19 testing at this time.
2. Each site should have already identified an area to isolate patients/visitors if needed.
 - a. In EB, this room is to the right of the PSC front desk on L2.
 - b. Sibley: located near the front check-in desk
 - c. Rockledge: adjacent to front desk.

Resource: **COVID-19 testing:** https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_testing_algorithm.pdf

HEIC <https://intranet.insidehopkinsmedicine.org/heic>

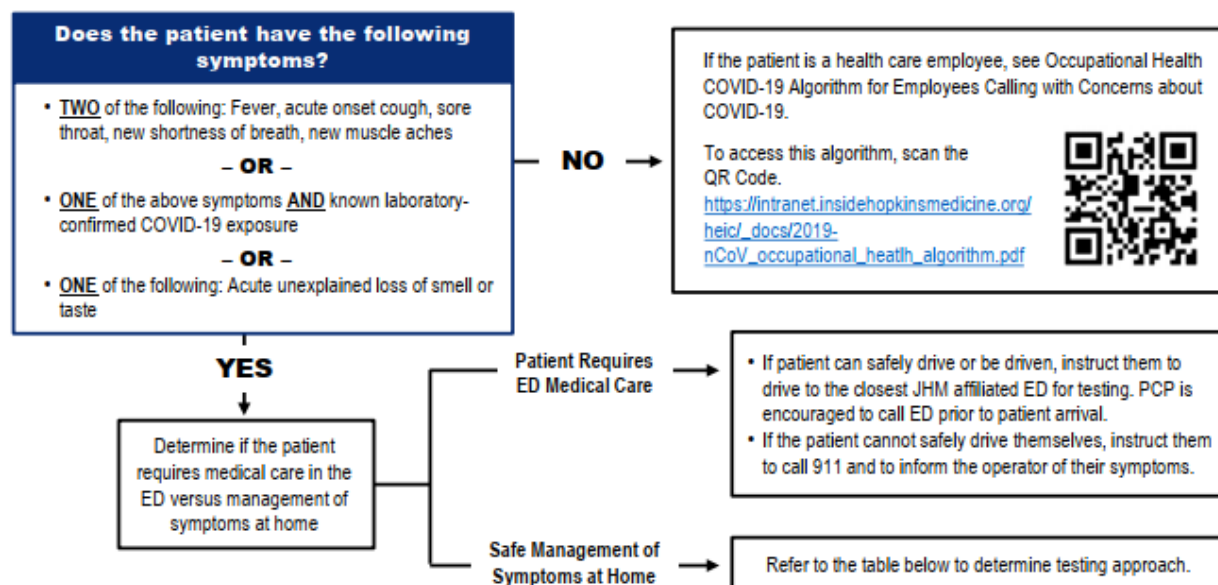
Microbiology COVID-19 Testing Information

<http://pathology.jhu.edu/campus/Microbiology-COVID-19.cfm>

COVID-19 Testing Algorithm for Pediatric and Adult Ambulatory Clinics

Testing algorithm based current COVID-19 testing availability. Algorithm will be updated as availability increases*. Use clinical judgement.

UPDATED MARCH 29, 2020 at 9:45 AM EST



Patient less than 65 years old, immunocompetent AND not a healthcare worker	Patient at High Risk for Transmission**	Patients who meet any of the following criteria:
<ul style="list-style-type: none"> COVID-19 testing NOT indicated at this time. Instruct patient to home isolate per CDC guidance (link below). Consider Tamiflu. 	<ul style="list-style-type: none"> COVID-19 testing is indicated. Place a COVID-19 order in Epic. Instruct patient to home isolate until symptoms resolve. Provide patient with CDC guidance (link below). <p>NOTE: For healthcare employees, return to work should be coordinated with occupational health</p>	<ul style="list-style-type: none"> Age ≥ 65 years Age ≥ 18 years with a chronic disease (cardiac, pulmonary, renal, diabetes) ‡ Immunocompromised (all ages) Pregnant or within 2 weeks postpartum (all ages)
<p>**Patients at high risk for transmission:</p> <ul style="list-style-type: none"> Frontline healthcare workers, emergency management services and safety personnel (e.g., police officers, fire fighters) Patients where a positive COVID-19 test could result in significant transmission; such as a patient receiving outpatient dialysis, attending infusion clinics, radiation oncology and those referred from by Health Care for the Homeless. Donor and recipient testing for bone marrow transplant. Patients whose medical treatment/management would change significantly if a COVID-19 test is positive; such as an oncology patient whose chemotherapy would be placed on hold if they tested positive for COVID-19. <p>‡ Pediatric Patients (<18 years) - The incidence of COVID-19 infection and severe disease in children is low. If a pediatric patient has a significant underlying lung disease or comorbidity and he or she has symptoms severe enough to consider hospital admission then please refer to the Pediatric ED testing algorithm.</p> <p>Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019: https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html</p>		

*We recognize that testing results can be used to encourage adherence to home isolation. However, at this time, we are prioritizing testing based on medical needs and assuming optimal adherence if patient is directed to home isolation.

12. Staff Protection

- a. All equipment should be cleaned with greater frequency. All treatment areas should be cleaned with [approved cleaner](#) between each patient including the linac couch, the simulator couch, and all door handles or any other items that patients touch routinely. All examination and treatment spaces as well as common spaces within clinics and waiting rooms should undergo thorough cleaning at least twice a day. Cleaning should include but not be limited to countertops, chair armrests and other non-fabric components, door handles, computer terminals, and telephones.

Approved Disinfection Product List

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_product_chart_east_baltimore.pdf

- b. Staff that have 2 or more of the following symptoms: fever, cough, sore throat, shortness of breath or myalgias that began in the last 72 hours should contact occupational health to be considered for flu and COVID testing. Please keep your manager informed.
- c. **Face Masks for Patients:** Offer a face mask to all patients with respiratory symptoms, and ask them to wear it any time they are not in their room.
- d. **Droplet Precautions for Health Care Personnel:** Use droplet precautions when caring for any patient with respiratory symptoms. Droplet precautions require wearing a gown, gloves and a mask with eye protection (such as a face shield or goggles). Maintain droplet precautions for patients following respiratory viral testing until symptoms resolve or another cause for the symptoms is identified **and** until discontinuation is discussed with your Johns Hopkins infection control representative.

In order to reduce your risk of coming into contact with respiratory droplets during patient positioning, as of March 31, 2020, we are requesting that radiation therapists use both a **surgical mask AND a face shield** while in close contact with patients with any of the following:

- treatment to the head and neck
- treatment to the brain and cervical spine
- any patients with respiratory symptoms (including patients who have been asked to wear their own surgical masks due to respiratory symptoms but are not currently COVID-positive or undergoing testing)

Face shields are **OPTIONAL** for: thoracic, breast, or other disease sites in which the therapist feels at particular risk for being in close contact at the level of the patient's

mouth. The decision to use a face shield is at the therapist's discretion for such cases. However, if you do choose to use a face shield for an optional patient, please ensure that this is communicated to other therapy staff at your machine so that it is done **consistently** thereafter, in order to minimize patient concerns about different practices between staff.

For all other patients not meeting these or other PPE criteria, surgical masks alone (without face shields) may be worn if the therapist will be <6 feet away from the patient.

After each use, staff should wash their hands, clean the shield with an [approved cleaner](#) (first the provider-facing side of the shield, then the patient-facing side), and then cleanse their hands again.

Face Mask for Staff

- As of April 3, 2020, all staff are required to wear a face mask while working at a JHM healthcare facility. Make sure to care and conserve your surgical mask for multiple uses. Please obtain a mask from the designated clinic coordinator. When wearing a mask please make sure your mouth and nose are covered.
- **Universal masking guidance:**
https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_04_02_masking.pdf
- N95 is only to be worn with face shield when providing care for a PUI or COVID+ patients.

Other Guidelines

- Guidelines for caring for your surgical mask:
 - Do NOT touch the surgical mask while wearing it
 - If you touch the surgical mask, perform hand hygiene
 - Discard damp or soiled masks, remove your surgical mask prior to leaving the unit and store in a paper bag
- Guidelines for caring for a face shield:
 - Carefully removed and cleaned by wiping all surfaces of the face shield with facility approved disinfectant wipes.
 - Face shields can be stored in a plastic bag (e.g., patient belonging bag) or strapped to your JHM Personnel Preparedness Pack (JHM P3).
 - Discard cracked face shields
 - PPE (Personal Protective Equipment) including PAPRS should be worn for PUIs. Please refer to the educational video on PPE training.
- All “public” food supplies (cookies/candy in clinics) must be removed. During this time, no guests/visitors/catered food brought in by outside vendors for large groups are permitted in the Radiation Oncology clinic or administrative spaces.
- Scrubs are strongly encouraged for staff with direct patient contact if available at your site. When used, please use a new pair daily and change into and out of the scrubs at the clinic site. Do not wear scrubs home. If no scrubs are available at your site and/or due to shortages, please consider wearing easily laundered clothes that you change out

at the clinic site or immediately upon returning home. Avoid repeated wear of these clothes between laundering.

- Use of neckties/scarves and white coats that are not cleaned daily is discouraged.
- Hair, including facial hair, may serve as a means for viral transmission. Try to avoid touching your hair, and those with long hair are encouraged to wear it pulled back from the face when interfacing with patients and staff.
- Please continue hand hygiene all throughout the day—and check yourself for symptoms before coming to work. All employees are asked screening questions on Kronos and/or when logging into your computer.

PPE use

<https://www.youtube.com/watch?v=vp1fOVSPinI&feature=youtu.be>





- Guidance on how to conserve specific PPE
 - https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_conserving_ppe.pdf
- Video on conserving PPE:
<https://www.insidehopkinsbayview.org/news/covid19/20200320conservecleanppe.html>
- Guidance on appropriate use of PPE

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_26_appropriate_ppe_use.pdf

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_ppe_video_handout.pdf

PPE Training

- How to use a PAPR:
<https://webcast.jhu.edu/Mediasite/Play/2d52db166f4e4c1283a75e54d5b709b61d>
- Donning and Doffing PPE with an N95 mask and visor/goggles:
<https://webcast.jhu.edu/Mediasite/Play/ef9e7c6e4e1d40f3a8185f83268f20231d>
- Donning and Doffing PPE with a PAPR:
<https://webcast.jhu.edu/Mediasite/Play/5164b5f8af71469ab58a3b67475821901d>

PHOTO	WHO WILL USE IT	WHEN TO USE IT
<p>Surgical mask <u>with</u> face shield <i>The intent of the face shield is to protect your eyes and mask during clinical care.</i></p> 	Staff who interact with patients or work in clinical units/areas	When caring for a patient who needs droplet precautions and who is not known to have COVID-19 or is not a patient under investigation (PUI)
<p>N95 <u>with</u> face shield* <i>The intent of the face shield is to protect your eyes and respirator during clinical care.</i></p> 	Staff who interact with patients or work in clinical units/areas	<ul style="list-style-type: none"> • When in close contact with a PUI for COVID-19 • When caring for a patient with known COVID-19 • When entering select units where COVID-19 patients are located • When performing high risk procedures
<p>Dräger respirator <u>with</u> face shield* <i>The intent of the face shield is to protect your eyes and respirator during clinical care.</i></p> 	Staff who interact with patients or work in clinical units/areas	<ul style="list-style-type: none"> • When in close contact with a PUI for COVID-19 • When caring for a patient with known COVID-19 • When entering select units where COVID-19 patients are located • When performing high risk procedures
<p>Powered Air Purifying Respirator (PAPR)</p> 	Staff who interact with patients or work in clinical units/areas	<ul style="list-style-type: none"> • When in close contact with a PUI for COVID-19 • When caring for a patient with known COVID-19 • When entering select units where COVID-19 patients are located • When performing high risk procedures

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_26_appropriate_ppe_use.pdf

Risk Mitigation Strategies and Personal Protective Equipment (PPE) Utilization Guidelines

UPDATED MARCH 24, 2020

Purpose

General guidance and explanation of current personal protective equipment (PPE) strategy

Protection of health care employees is a top priority. We are taking every precaution to ensure a stable supply of PPE and to conserve and extend our existing supply. We are also exploring alternative approaches to obtain equipment, such as manufacturing our own face shields and putting together JHM Personal Preparedness Packs (JHM P3s) for distribution to clinical personnel in a prioritized fashion, based on location (high-risk locations first), specialty and procedures routinely performed. Our supply chain continues to work in creative ways and with other resources to acquire additional PPE supplies. The goal is to provide each employee with a JHM P3 pack.

Prioritization by Location

As we begin distribution of the JHM P3 packs, priority is given to areas of the hospital that care for large numbers of patients requiring PPE, such as the ED, ICUs and similar locations where COVID-19 and PUI patients are located. Similarly, there are areas in some of our hospitals that preferentially isolate COVID-19 and patients under investigation (PUI). These are defined as high-priority areas to receive JHM P3 packs and fit testing for N95 as appropriate.

Prioritization by Specialty

Priority is given to clinicians — nurses, technicians, providers and other staff members — whose specialty care results in high-risk exposures based on the nature of their work. This group is high-priority to receive PPE and fit testing. Examples are providers who intubate and provide anesthesia, nurses, technicians, respiratory therapists and other staff who care for COVID-19 and PUI patients, or assist in high-risk procedures (see below).

Prioritization by Procedure

In order to preserve PPE for staff who care for COVID-19 patients or PUI patients, please institute the following prioritization strategies immediately:

- Only perform urgent/emergent procedures.
- Departments are responsible for identifying the critical individuals needed to safely perform any procedure in order to minimize PPE use.
- All attempts must be made to minimize the number of staff present for procedures to preserve PPE.
- Prioritization of fit testing is based on the risk of exposure to aerosols that could serve as a mechanism of COVID-19 transmission.
- Current capacity does not allow for COVID-19 testing of asymptomatic individuals. As testing capacity expands, COVID-19 testing can be incorporated into pre-op workflow for high-risk procedures.
- As the primary mechanism of COVID-19 transmission is through respiratory droplets, careful attention to wearing a surgical mask with face shield, hand hygiene, and gown/glove use is critical to health care worker protection.

COVID-19 Positive Patients

All staff who participate in the care of a known COVID-19 patient or a PUI should wear PPE to protect against airborne pathogens, in addition to contact precautions with eye protection. For all PUI and COVID-19 positive patients, PPE must be used by all personnel participating in procedures. Minimize the number of people who have to be in the room to safely care for the patient.

Asymptomatic Patients Without a COVID-19 test

Staff have expressed concerns about the risk of performing procedures on asymptomatic patients or being in the room where these procedures are being performed (i.e., that such patients might harbor undetected coronavirus that could be aerosolized during a procedure). While we understand the concern, we anticipate that the rate of completely

asymptomatic transmission is low. It must be emphasized that all patients are screened for symptoms to determine eligibility for COVID-19 testing prior to every procedure to prevent us from unknowingly performing procedures on at-risk patients. If every team member were to wear airborne PPE for every possible procedure on these asymptomatic patients, it would cause a dramatic increase in PPE usage that would exacerbate the scarcity of critical PPE equipment, threatening to exhaust the remaining supply while known COVID-19 positive patients still require care.

Therefore, we have defined which procedures have the highest risk of aerosolizing fluids containing this respiratory virus. Please note that procedures in and around the mouth, nose and throat represent the highest-risk procedures for generating droplet or aerosolized particles. **For those patients whose COVID-19 status is unknown (screen negative by symptoms), prioritization of the use of airborne precautions PPE — a powered air-purifying respirator (PAPR) hood or N95 respirator with a face shield or protective eye wear — for all staff participating may be utilized for the following procedures:**

- All those participating in an active CODE of a patient
- Any airway intervention
- Interventional pulmonary procedures
- Procedures which involve the throat, mouth, nose and sinuses
- Tracheotomy procedures
- Upper endoscopy procedures
- Thoracic procedures

Some patients arrive to the hospital unconscious with no collateral information available to screen them appropriately to determine if they are a PUI. For those patients who must have emergent procedures, it would be appropriate to use airborne PPE by staff during the above list of procedures.

For all other procedures performed in the operating room or procedure room on COVID-19 unknown (screened negative by symptoms) patients, the individuals managing the airway (due to direct exposure to the respiratory droplets during intubation) will use airborne PPE, but all others in the room will not need to use PPE for airborne pathogens for those cases.

13. Treatments

Management of Persons Under Investigation (PUI)

If a patient becomes a person/patient under investigation (PUI)⁴, the following processes will be followed:

- If the patient is on treatment, the patient will be managed as presumptively positive.
- A treatment break should begin until the test result has become available.
- Once a negative result has been obtained, treatment may be resumed.
- PUI designated as “Level 1” may continue treatment and will be managed as COVID+ until proven otherwise.
- For any patient interaction during the investigation phase (which should be avoided if at all possible), staff should wear appropriate protective equipment (droplet precautions), including a PAPR or fitted N95 mask.
- Patient and visitor (if present; also only allowed in cases of necessity) should wear a surgical mask when in the health care facility.

Management of COVID+ Outpatients (including “Level 1” PUI)

Outpatients: Outpatients who are COVID+ or live in the same household as someone who is COVID+ will also be treated as presumptive positive:

- If a COVID+ patient is receiving palliative radiotherapy and the clinical team determines that there is an acceptable medical alternative, radiation treatment can be discontinued at the discretion of the treating physician.
- COVID+ patients will only be treated if they are categorized as “Level 1.”
- Patient should be moved to end of day treatment. This should continue for 14 days after positive diagnostic test and 7 days after resolution of symptoms, whichever is longer. Given that the duration of contagiousness of patients who have recovered from COVID-19 illness is unknown at this time, patients who resume treatment after a break necessitated by COVID-19 infection will also be treated at the end of the day on a single LINAC.
- No visitors are permitted, with rare exceptions made for caregivers of the severely impaired.
- Patient should wear surgical mask.
- Patient should enter the facility via a low volume entrance and move to a dedicated isolation room while waiting for treatment (not in the waiting room). This isolation room should not be used by other oncology patients for the rest of the day.
- Staff should wear appropriate protective equipment (droplet and airborne precautions) which includes double gloves, non-permeable gown, and a PAPR or fitted N95 with face shield.
- Multiple patients that are COVID positive will be treated sequentially on one machine in each center rather than on multiple machines.
- Follow up patient visits should be deferred for at least 2 weeks if feasible. This must be documented in the electronic medical record.

Workflow for COVID-19 Positive Patients

a. Screening

Use [Outpatient Office Guidelines for COVID-19](#) to screen patient.

If patient falls under “Take Action” category, follow Step 2 and Isolate patient if screening is positive. Assess whether radiation treatment can be held for 72 hours while patient discuss need for COVID-19 testing with oncologist and testing is arranged if needed.

- If radiation treatment cannot be delayed and patient meets criteria for COVID-19 testing (see testing algorithm), place order in Epic and arrange for radiation treatment in one of the designated locations.
 - See table below for designated testing locations.
 - Patients with unexplained respiratory symptoms who are in need of urgent radiation treatment should be considered potential COVID-19.

- If radiation treatment can be delayed for >72 hours, advise patient to call his/her oncologist for further assessment of the need for testing before proceeding with radiation treatment.

Table 1.

Radiation Oncology Clinic	Designated location for radiation treatment for PUI or laboratory confirmed COVID-19	Designated location for testing of ambulatory patients
JHH	JHH	JHH
Greenspring	JHH	JHH
BMC	BMC	JHH
Sibley	Sibley	Sibley
Suburban	Sibley	Suburban

Hospitalized patients should be tested following recommended protocol (HCW wears contact precautions with PAPR or N95 plus eye protection for collection of nasopharyngeal swab).

Radiation treatment for PUI/laboratory confirmed COVID-19 patient

- Staff need to wear airborne (N95 with face shield or PAPR), double gloves, and non-permeable gown. Patient must wear a surgical mask AT ALL TIMES during treatment. An additional staff member should act as a safety officer to ensure PPE is worn appropriately. At JHH a safety officer can be requested at x29600.
 - If patient maintains surgical mask, next patient can be entered without lag time.
 - If patient needs an immobilization mask for treatment and does not wear a surgical mask for the entirety of the procedure, air must be cleaned with HEPA filter and wait for 2 hours (exam room) or the time specified for t99.9% air flow exchange listed in Table 2 for treatment vaults before next patient.
- Patients with COVID-19 infection will be cohorted to be treated in the same room prior to terminal clean.
- After last COVID-19 infected patient of the day, let the treatment vault undergo t99.9% air flow exchange for the times listed in Table 2. If patient is in an exam room, let sit for 2 hours- then call Environmental Services to have terminal clean.

Treatment for Ambulatory Patients

1. Nurse and Therapist should jointly call patient before appointment to explain new process to them. The staff will identify the Priority of support patient will need to get from car to treatment machine (ie. If they can walk on their own or if they will need wheelchair assistance).
2. At JHH, the patient should park in the Weinberg Garage. Bayview patients will enter through the side door. For Sibley see the Workflow Diagram (Appendix C); in the photon clinic, the patient will enter through the back door for employees, and in the proton clinic, the patient will enter through their regular proton parking garage door.
3. Patient then calls machine to let machine know that patient is here. Patient will sit in car until treatment machine is ready- machine will call patient back before they come to get patient. In alignment with new visitor policy, patients who are COVID+ are not allowed to have visitors with them.
4. Prior to entering building patient will place surgical mask on. If patient is able to ambulate on own without assistance, therapist getting the patient should wear double gloves, gown, and N95 with face shield or PAPR. Patient will be brought by therapist in through staff only hallway directly back to the machine. Patient should be instructed to not touch doors/anything.
5. If patient needs to change their clothing they would change inside the machine/treatment room
6. Prior to entering the treatment room:
 - a. Patient needs to hand sanitize (should we provide own sanitizer bottle/pump for time of tx and label pts name)
 - b. Staff needs to hand sanitize and put on gown, and double gloves, N95 with eye protection (N95 and goggles or N95 under face shield) or PAPR.
 - c. Limit number of therapists as much as possible (no more than 2 therapists in room)
7. Therapists set up the patient in the room.

Right before the therapists exit the room do the following

 - Purell on outer gloves and remove outer gloves.
 - Remove gown and place in regular trash inside the room.
 - Purell on outside of the inner gloves. Remove gloves in designated trash can.
 - Hand sanitize.
 - Remove and preserve N95 or PAPR for personal use for next COVID-19 patient.
 - Wash Face Shield with approved disinfectant (inside then outside). Throw away wipe in trash.
8. Therapist that setup patient, still wearing appropriate PPE, will stand off to the side during treatment while other therapist do computer work.
9. Repeat donning process, help patient out of the machine.
10. Let patient get changed if needed (turn back to respect privacy without leaving area so you do not have to doff/don again if appropriate to do so). While in room wipe down necessary equipment.
11. Escort the patient out of the clinic space to the Weinberg garage.

Admitted Patient

The department understanding at this time is that we will not per routine treat a COVID+ inpatient. However, in special circumstances of an emergency cancer case where the cancer is life threatening or urgent and the respiratory/medical symptoms are well controlled and stable, treatment of a COVID+ inpatient will be performed.

At beginning of day, therapy machine calls unit to set up transport for patient to come to radiation oncology at the end of the day or designated time with official transport/Life Line (JHH) for inpatients coming from other entities. Rad Onc Charge RN will get hand off from primary RN and request a phone call when transport arrives to unit to take patient to radiation oncology to allow for pathway to be cleared in Radiation Oncology. The patient will be transported directly into the treatment room.

Transport team will stay during the treatment to ensure prompt return to the patient's home unit after treatment is complete.

Prior to entering the treatment room:

- Patient needs to hand sanitize (should we provide own sanitizer bottle/pump for time of tx and label pts name)
- Staff needs to hand sanitize and put on full PPE: gloves, gown, second pair of gloves, and N95 or PAPR

Limit number of therapists/staff as much as possible. If patient needs transfer from bed to couch use disposable transfer device.

Therapist(s) set up the patient in the room.

Right before the therapists exit the room, do the following:

- sanitize outer gloves and remove.
- remove gown and place in designated trash. Sanitize (purell) inner gloves in designated trash can. Hand Sanitize.
- Remove and preserve N95 or PAPR for personal use for next COVID-19 patient.

Therapist that setup patient, still wearing appropriate PPE, will stand off to the side during treatment while other therapist do computer work.

Set up the machine and treat as normal

Before going back into room therapists must:

- Hand sanitize
- Outside the room don inner gloves, gown, outer gloves, N95/face shield.

Therapist helps patient off machine.

Repeat removal of PPE as per guidelines above.

Guidelines for healthcare workers returning home after taking care of a COVID+ patient:

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_hcw_returning_home_after_care_of_patient.pdf

Terminal Cleaning

After treatment of COVID+/PUI, terminal cleaning procedures must be performed in the machine vault prior to treatment of the general population. This will be performed in the morning of the next business day before the scheduled first patient, in order to minimize exposure to environmental services staff responsible for the terminal clean.

Radiation treatment for Patients recovering from COVID-19 infection

Patients may resume treatment without COVID-19 precautions after meeting the following Non-test-based strategy

- At least 3 days (72 hours) have passed *since recovery* defined as resolution of fever without the use of fever-reducing medications **and** improvement in respiratory symptoms (e.g., cough, shortness of breath); **and**,
- At least 7 days have passed *since symptoms first appeared*

(HEIC and [CDC](#), retrieved March 26, 2020)

How to add an alert in MOSAIQ for COVID-19 Positive Patients

1. When in the patient's Chart in MOSAIQ under their name in the upper left you will see a small box with Alerts
2. You can click on edit in that box and it will open the window where you can add an alert
3. In there, one can Add->Alert and it will add on to the alert section.
4. Recommendation: use the Type "Infection Control" and then in the Comment add COVID 19. The end result will just show Infection Control in the Alert box and one can click edit again to see the comment.

The screenshot shows the MOSAIQ interface for a patient named TEST, TEST (MRN: 99999905). The 'Allergies and Alerts' window is open, displaying a table for Allergies and a table for Alerts. The Alerts table has one entry: Infection Control, Active, 3/25/2020, COVID19.

Type	Allergen	Reaction	Severity	ID Date	Status	Comments	Source	Import Da...

* Indicates no drug-allergy interaction checking
eChart Formulary not registered or disabled. Drug warnings are not active.

Type	Status	ID Date	Comments
Infection Control	Active	3/25/2020	COVID19
[Add alert]			

Never Reconciled

14. Device Management

Airflow Exchanges on Linear Accelerator and Proton Vaults and Simulator Rooms

If COVID+/PUI patients are treated/scanned, full (99.9%) airflow exchange must occur and terminal cleaning procedures must be performed in the treatment vault or simulator room prior to treatment/scanning of the general population during the next business day. In order to determine the times required for full airflow exchange in each treatment vault and simulator room, these values were either directly measured by facilities staff or estimated using the range of minimum to maximum flow rates from the room design specifications to extrapolate clearance levels. Table 2 summarizes the relevant airflow exchange times for the treatment vaults, simulator rooms, and control rooms across our clinical sites. We used these data to select treatment vaults that were most appropriate for treating COVID+/PUI in each departmental site. For example, in review of data for the East Baltimore site, full airflow exchange times for the vaults of our most versatile linear accelerators ranged from 41.1 to 71.3 minutes; thus, we selected the vault with the shortest exchange time for a treating future COVID+/PUI patient.

Table 2: Airflow Exchange Times for Treatment Machine Vaults, Simulator Rooms, and Control Rooms

Machine Vault or Simulator/Control Room	Measurement*	Airflow Exchange per Hour	t 99% (minutes)	t 99.9% (minutes)	Air Pressure Direction
East Baltimore					
Versa1	actual	10.07	27.72	41.14	positive
Versa2	actual	5.94	46.53	69.97	positive
Synergy	actual	5.83	47.39	71.30	positive
Tomotherapy	actual	16.99	16.60	24.31	positive
CyberKnife	actual	7.63	36.40	54.39	positive
CT Simulator-1	actual	27.99	10.17	14.71	negative
CT Simulator-2	actual	20.99	13.49	19.65	negative
HDR Vault	actual	21.5	13.17	19.18	negative
HDR Control Room	actual	17.7	15.94	23.22	negative
MR Control Room	actual	8	34.74	51.86	positive
Sibley Memorial					
All standard LINACs	minimum	12	23.34	34.49	
	maximum	18	15.68	22.94	
Tomotherapy	minimum	10	27.91	41.43	
	maximum	15	18.75	27.55	
All proton gantries	minimum	6	46.07	69.26	
	maximum	12	23.34	34.49	
Photon CT Simulator	minimum	10	27.91	41.43	
	maximum	26	10.93	15.84	
Bayview					
BVAgility	actual	6.5	42.59	63.91	
Suburban					
Versa3486	actual	8	34.74	51.86	
Green Spring Station					
InfinityGS	actual	6.5	42.59	63.91	
<p>*Actual measurements represent airflow measured under standard automatic temperature control and building automation systems settings. Minimum and maximum measurements represent the range of airflow rates delineated according room design specifications; these were not directly measured.</p> <p>t99%: time for 99% airflow exchange</p> <p>t99.9%: time for full (99.9%) airflow exchange</p> <p>Air Pressure Direction: Negative pressure room is defined as air flowing in and positive pressure room is defined as air flowing out.LINAC: linear accelerator</p> <p>HDR: high dose rate</p>					

Active Breathing Coordinator (ABC) Procedures

Based on current information from manufacturers and product suppliers, our ABC system's single-use mouth piece/tube with attached ViroMax filter has >99.99% filtration efficiency for viral particles and is reported to be effective for particles as small as 0.1 micrometer in size⁵. Currently, we do not have information regarding filtration efficiency for particles <0.1 micrometer, and it has been noted that COVID-19 particles may vary in size from 0.06 to 0.14 micrometers⁵. Although it may be assumed that the actual transmitting respiratory droplet size may be larger—and thus more effectively filtered—than individual viral particles themselves, the specific filtration efficiency across the range of COVID-19 particle size remains somewhat unclear.

In addition to this potential uncertainty, ABC is felt to be a higher-risk procedure for staff due to possible exposure to saliva and respiratory droplets that may be elaborated during ABC procedures. Further, it requires increased machine time and coordination between treatment machines when ABC systems are shared.

Given the information currently available, our procedure for ABC is as follows:

1. In general, no ABC use for COVID+, PUI, or those who screen positive for new respiratory symptoms*.
*Treating physician can evaluate if they feel that the respiratory symptoms are low-risk for being due to COVID and make an individualized decision to proceed with ABC at physician discretion if so.
2. Future patients: Limit ABC use to patients (a) without COVID+/PUI status or new respiratory symptoms AND (b) for whom there is clear clinical necessity of ABC use. "Clinical necessity" should be determined at the discretion of the treating physician and based on consensus from disease site-specific providers (Table 3 summarizes the approved indications for the use of ABC by disease site).
3. Patients currently on treatment: Can continue with ABC as long as the patients does not have COVID+/PUI status or new respiratory symptoms. Current patients whose new respiratory symptoms cannot be attributed to another low-risk cause should be replanned without ABC if at all possible. If current patients fall into this category and clinically require treatment with ABC, use of ABC will be reviewed with site clinical director on an individual basis.
4. If on-treatment patients using ABC convert to COVID+ or PUI status, the ABC system should be removed from use in the general population. It will not be returned to use until cleared by HEIC. When shared between treatment machines, ABC system use should be tracked to permit for identification of potentially exposed patients in the setting of an on-treatment patient converting to PUI/COVID+ status (if required per HEIC).
5. If there are PUI/COVID+ who clinically require treatment with ABC and cannot be put on a treatment break, they will be treated on a separate ABC system designated for COVID+ use. This may require transfer of care to a site with multiple ABC systems.
6. A new single-use mouth piece and filter kit must be used per treatment per patient. No reuse of these parts are permitted at this time.

	ABC use guidelines
Central nervous system	-
Gastrointestinal (GI)	<p>For GI tumors susceptible to motion, 4DCT will be acquired. Treatment with free-breathing or abdominal compression approach will be considered for all such patients. ABC is considered <i>clinically necessary</i> when treatment in free-breathing or with abdominal compression leads to unacceptably high risk for toxicity (as defined by the treating MD), and this risk would be substantially lowered with ABC. Specific considerations for the use of ABC include GI cases in which:</p> <ul style="list-style-type: none"> -Expanded lung volumes with ABC will reduce the risk of lung injury for patients with mediastinal disease. -Motion mitigation with ABC will lead to significant dose reductions in the abdomen or chest. In such cases, free-breathing or abdominal compression approaches may be particularly useful alternatives.
Lymphoma	As per treatment guidelines for tumor location
Thoracic	<p>ABC is <i>clinically necessary</i> for:</p> <ul style="list-style-type: none"> -Any re-irradiation case where the anticipated toxicity will be reduced with ABC. - Any conventionally fractionated case where a plan that meets minimum safety requirements cannot be achieved except with ABC. - Any hypofractionated or SABR plan that cannot meet normal tissue safety objectives or will not be well-visualized on cone-beam CT without the use of ABC.
Sarcoma	As per treatment guidelines for tumor location
Pediatrics	4DCT will be acquired in patients large enough for tracing to be obtained when there is a concern for susceptibility to motion. ABC will be considered <i>clinically necessary</i> and will be used in cooperative patients where ABC significantly reduces dose to organs at risk.
Breast	ABC technique will be used very judiciously and be considered <i>clinically necessary</i> only in cases with cardiac mean dose >4 Gy or lung V20>40% when free breathing techniques are used. In general, we should seek alternative approaches to ABC including IMRT/VMAT to meet dose objectives.

15. Molecular Radiation Sciences (MRS)

MRS has a two-phased approach:

1. Preparatory phase that includes mitigation and preparation for broad-spread disease activity and research activity closure if needed.
2. Active phase – university closure and working remotely.

During all phases the following are strongly advocated:

Best practices for avoidance of infectious diseases:

1. You must stay home if you are sick or experience flu-like symptoms (fever, cough).
2. Maintain diligent hand hygiene.
3. Cover your face when coughing or sneezing. Avoid touching your face.

Means of communication:

MRS follows all communications by JHU, JHU SOM, emergency authorities and department leadership.

MRS Division Director, or designees, communicate by email [rt-group-crb2].

MRS Call chain, personnel contact info and emergency contacts are kept updated.

MRS stores and distributes documents for emergency preparations at the following location: H Drive/ MolecularRadiationSciences/EMERGENCIES. COVID-19 related information will be available in folder: COVID-19 info

1. PREPARATORY PHASE

These preparations relate to lab and workplace safety and prepare for possible university or business closures. These include the following:

Expectation of shut-down of activities related to congregation of people (classes, seminars)
Expectation of access-restriction to buildings
Expectation that core services (maintenance, deliveries) will be shut down or limited
Expectation that core facilities will be shut down, or only minimal services exist
Expectation that even if deliveries work, supply chain may be severely compromised
Unknown impact on central services such as purchasing, research administration, HR etc.

The following activities are to be completed:

Update contact lists within teams/labs. In addition to the team/lab PI, assign two emergency contacts critical for each team.

Discuss within teams what are your mission-critical operations and how to respond to those.
These include:

Animal care: Follow and respond to communications by the Research Animal Resources. Limit the number of vital strains/cages. Clearly label vital cages and assign a lab person to look after. Plan for breeding schemes and genotyping bearing in mind that that animal facility functions and other services may be severely compromised. Plan for sperm/embryo freezing for absolutely essential strains. Prepare to close down ongoing experiments earlier than planned as needed.

Cell line stocks in N2: Prepare for worst-case scenario of lack of N2 supply. Consolidate number of boxes in N2. Plan critical samples that may have to be shifted to -80C freezer. Clearly label those boxes, and prepare a separate list what those are.

-80C freezers: Ensure that MRS emergency -80C freezers are empty to allow their intended use.

CO2 tanks: Replenish supply of CO2 tanks.

Equipment: Ensure that all equipment are clearly labelled with contact names and information.

IT: Ensure remote access to RADONC servers. Note that you cannot take off-site any clinical/HIPAA containing material.

Prepare for the following possible scenarios at non-clinical sites:

Cancellation of activities related to congregation of people (classes, seminars)

Access-restrictions to buildings

Core services (maintenance, deliveries) will be shut down or limited

Core facilities will be shut down, or only minimal services exist

Even if deliveries work, supply chain may be severely compromised

Unknown impact on central services such as purchasing, research administration, HR etc.

1. ENFORCING PREPARATORY PHASE ACTIVITIES

1. Non-clinical personnel to work off-site as determined by their managers and PIs.

2. Implement social distancing by rearranging seating areas and conduct meetings using remote access platforms such as Zoom.

These steps include the following actions:

- Cancellation of MRS seminar series.

- Implement remote working within teams. PIs/managers need to discuss within the teams and for example alternate days in the lab and off-site. PIs should communicate these planned arrangements to the MRS Administrative Coordinator.
- Seating areas will be rearranged to provide more distance between desks. Specific consideration will be given to those with underlying diseases or vulnerability to the infection.
- No visitors are allowed.
- Adhering to all guidance by central administration and eg those related to Research Animals.
- Disinfect all surfaces (e.g. doorknobs, sink handles, freezer doors, telephones) twice a day.

Lab orders and their arrival:

- Continue to place your orders in the usual way to your lab's order sheet.
- Another, shared sheet for all ordered items will be placed in HDrive/MolecularRadiationSciences. This allows us to track the incoming items, and who placed the order. Items that have arrived will be highlighted in YELLOW.
- Orders will be received at the 441 cubicle area and the recipient/lab will be notified. All +4C items will be placed in cold room. All -20C items will be placed to -20C Freezer in 416 labelled 'RECEIVED -20C GOODS'.
- Each lab must log the receipt of the items to their respective order sheets.

2. ACTIVE PHASE

- No new experiments are to be started.
- Plan to close down on-going experiments the day before required close-down.
- Pay attention that all biohazard or otherwise hazardous materials are safely stored/sealed.
- Switch off and secure all equipment that are not needed.
- Disinfect all surfaces (e.g. doorknobs, sink handles, freezer doors, telephones) on afternoon before closing.
- PIs/managers should continue to instruct their teams to execute planned and meaningful activities remotely such as analyze data, read current literature and plan continuation of research activities, write manuscripts and grant applications, brainstorm, update lab protocols, update lab stock lists or any other tasks that may otherwise not have received full attention.
- Ensure that all of your staff have access to the RadOnc servers.
- Conduct lab meetings remotely using eg Zoom (<https://jhjhm.zoom.us/>).
- Lab personnel designated as essential will perform critical procedures, processes or equipment management that require regular personnel attention to maintain laboratory viability (e.g. liquid nitrogen tank filling, animal support).

ACTIVITY AS OF 3/18/20:

- All labs are locked. A key to 416 has been assigned to a member of each lab.

- Equipment galley 437 doors to remain open to enable ventilation and cooling.
- All other instruments are unplugged except freezers, fridges and ice machine.
- Dry ice delivery suspended until normal operations resume.
- SKCCC Core facilities suspended until further notice.
- Loading dock will remain open as of now. Outstanding lab orders will be delivered. Fedex express shipments will continue to come directly to the floor. If temperature sensitive items are received, items will be placed to a dedicated fridge or freezer in 416. Dr. Laiho will periodically check the deliveries and notify you.
- N2 key has been moved from 462 to 416 to its previous location (next to Hester's desk, top drawer labelled as KEY).
- Only persons deemed "essential" will be allowed in to conduct mission-critical activities.
- You will only be able to access CRB 2 from CRB 1 by swiping your ID. Depart through CRB 1.
- Maintenance/housekeeping should be operating as normal.
- Follow IT's guidance to access remotely. If require help, submit help desk ticket.
- Be careful, mindful if on premises alone. If you observe unknown persons, contact security.
- There is no access to coffee/tea and office supplies.
- To access voice mail on your desk phone remotely, dial 410-614-8900. Follow the prompts.
- Continue to follow JHU and departmental leadership communications.

16. General Links and Resources

Johns Hopkins University CEPAR (Office for Critical Event Preparedness and Response):

<https://www.hopkins-cepar.org/>

Johns Hopkins Medicine guidance: <https://intranet.insidehopkinsmedicine.org/heic>

CDC guidance and information: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>

Johns Hopkins CSSE

map: <https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

Resources

- Central communication is updating Hopkins website frequently. Please refer patients to the site: <https://www.hopkinsmedicine.org/coronavirus/for-johns-hopkins-patients.html>
- Please continue to refer to the HEIC intranet site for the most timely and up to date information, contact numbers and FAQs. <https://intranet.insidehopkinsmedicine.org/heic>
- Guidance regarding the management of COVID-19 positive patients will be available on the [HEIC intranet](#).
- If any staff travels outside the state/country they need to call OCC health before returning to work and then follow up with their manager **(this does not include travelling or commuting to JHM clinical sites)**.
 - JHH, GSS, & SOM [410-955-6211](tel:410-955-6211)
 - Suburban is [301-896-3167](tel:301-896-3167),
 - Sibley [202-537-4265](tel:202-537-4265)
 - BV is [410-550-0477](tel:410-550-0477)

All links included in this document:

COVID-19 testing:

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_testing_algorithm.pdf

HEIC

<https://intranet.insidehopkinsmedicine.org/heic>

Occupational algorithm for employees

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_occupational_health_algorithm.pdf

Microbiology COVID-19 Testing Information

<http://pathology.jhu.edu/campus/Microbiology-COVID-19.cfm>

PPE training

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_ppe_video_handout.pdf

<https://www.youtube.com/watch?v=vp1fOVSPinI&feature=youtu.be>

Guidance on appropriate use of PPE

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_26_appropriate_ppe_use.pdf

People calling with concerns regarding screening

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_phone_triage.pdf

Telemedicine program

<https://intranet.insidehopkinsmedicine.org/telemedicine>

Telemedicine training document:

<https://livejohnshopkins.sharepoint.com/sites/epictraining/Epic%20Training%20Dropbox%20ocLib/Telemedicine%20Preparation%20for%20COVID.pdf>

Other resources

COVID-19 Clinical resources page

https://intranet.insidehopkinsmedicine.org/heic/novel_coronavirus/clinical_resources#language_services

Interpretative Services

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_17_interpretation_services.pdf

Childcare needs

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_16.pdf

Occupational Health Contacts

https://intranet.insidehopkinsmedicine.org/heic/docs/occupational_health_contacts.pdf

Visitor Guidelines

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_jhm_2020_03_13.pdf

Krames Education on Social Distancing and Self Quarantine

<http://johnshopkinsibportal.staywellsolutionsonline.com/Search/22,1307>

Please Do Not Visit If Sick Signage

https://intranet.insidehopkinsmedicine.org/heic/docs/do_not_visit_if_sick_signage.pdf

Approved Disinfection Product List

https://intranet.insidehopkinsmedicine.org/heic/docs/2019-nCoV_product_chart_east_baltimore.pdf

Appendix A. Breast Radiation: Detailed Breast Radiation Guidance 3/25/20

This guidance reflects the current prioritizations of the Johns Hopkins breast radiation oncology team and will be updated as the COVID-19 situation evolves. These guidelines are based on the four general principles outlined in the Yale documents posted on ASTRO's ROhub web page (Remote Visits; Avoid Radiation; Defer Radiation; and Shorten Radiation)¹ and is strongly informed by the Yale document as well as a multitude of posted comments and algorithms across social media platforms:

1. Remote Visits- already adopted at the institutional and department levels. While breast examination is still needed for the majority of our new patients, we will minimize the time in room by doing as much remotely as possible and limiting exam to that which is necessary to inform radiation decisions. On-treatment visit (OTV) skin checks can be done by visualization only, and the provider can ask the patient to manipulate their own breast tissue to show inframammary and axillary areas.
2. Avoid Radiation- we will review each case to determine if radiotherapy (RT) can be omitted based on low risk criteria. Subgroups that should avoid radiation unless there is a unique clinical consideration include:
 - a. Patients meeting CALBG 9343²/PRIME II³ criteria for omission of RT
 - i. While the current National Comprehensive Cancer Network (NCCN) guidelines⁴ reflect an age cutoff of 70 years, consider RT omission for those 65 years and older who meet PRIMEII criteria.
 - b. Patients meeting RTOG 9804 criteria⁵ for ductal carcinoma in situ (DCIS) for whom we can consider omission of RT: small size (<2.5 cm), grade 1-2, and resected to ≥ 3 mm margins—particularly if ER+ and the patient plans to receive endocrine therapy. At this time we are not considering genomic profiling to support RT omission in this group but are instead relying on clinical factors.
3. Defer Radiation- we can also consider delaying RT up to 4 months in other low risk patients who can bridge the treatment gap by taking endocrine therapy. Criteria for deferring RT may include (but not limited to):
 - a. Breast Conservation
 - b. Age >50 years
 - c. Hormone receptor + and agrees to take endocrine therapy
 - d. Grade I/II
 - e. Widely negative (≥ 2 mm) margins
 - f. Lymph node negative
 - g. Oncotype <18, if ordered, as per the IDEA protocol⁶
4. Shorten Radiation- we will increase our use of hypofractionated regimens and extend this approach to a broader population, when supported by at least phase II data
 - a. For low risk patients eligible for accelerated partial breast RT (ABPI), follow ASTRO consensus⁷ for “suitable” and “cautionary” but not “unsuitable” patients. To avoid twice-daily or protracted courses, we are recommending:
 - i. 30 Gy in 5 fraction regimen reported by Livi, et al⁸.
 - b. Consider hypofractionation for patients who require post-mastectomy RT (PMRT) and/or regional nodal irradiation (PMRT/RNI)

- i. Use the FABREC regimen⁹ of 42.4 Gy in 16 fractions for breast/chest wall and adjacent nodes and 39.9 Gy in 15 fractions for the SCV field (if applicable)
 - ii. No boost for PMRT cases, consider boost for intact breast (see below)
 - iii. Strongly consider this approach for:
 - 1. No reconstruction
 - 2. Age over 45 years
 - 3. No adverse risk features as described below
 - iv. Although it would be reasonable to use conventional fractionation, also consider this approach for:
 - 1. Age under 45 years
 - 2. Reconstruction (permanent implant, flap reconstruction, or tissue expander in place)
 - 3. Adverse feature(s) such as:
 - a. Triple negative
 - b. Stage III at presentation/ extensive nodal involvement
 - c. Residual disease after pre-op chemotherapy
 - c. Radiation boost
 - i. Strongly consider omitting boost in PMRT setting unless it is a nodal boost, there is a clear chest wall target, or in the case of inflammatory disease
 - ii. Strongly consider omitting boost in lower risk patients after lumpectomy
 - 1. All patients >65-70 years (DCIS and invasive, unless a specific clinical criterion is present)
 - 2. Low grade DCIS in >50 years (if treating)
 - 3. Any patient who meets all of the following criteria
 - a. Age >50 years
 - b. hormone receptor + and agrees to take endocrine therapy
 - c. Grade I/II
 - d. widely negative (≥ 2 mm) margins
 - iii. Continue tumor bed boost for:
 - 1. Age <50 years after BCT (DCIS and invasive)
 - 2. All patients with residual disease in the breast after neoadjuvant chemotherapy and breast conserving surgery.
 - 3. High grade tumors (invasive or DCIS) between ages of 51-65/70 years.
 - 4. Focally positive margins
 - iv. For new patients whose treatment plan has not been completed, strongly consider integrated boost approach, as used in RTOG 1005¹⁰
 - 1. 40.5 Gy to whole breast & 48 Gy to lumpectomy cavity in 15 fractionations; will likely require IMRT/VMAT for most cases
 - d. Can consider more extremely hypofractionated approaches, such as the UK FAST-Forward¹¹ (whole breast 26 Gy in 5 fx), in the future as the situation evolves but are NOT currently adopting these regimens.
5. Treat without altering recommendations:

- a. Inflammatory disease (non-metastatic)
 - b. Locoregional disease progressing through chemotherapy
 - c. Palliation to breast sites causing severe pain or uncontrolled bleeding
- 6. Managing treatment breaks for patients whose treatment is interrupted due to COVID-19 (as per Yale's recommendations¹). This will need to be individualized but in general:
 - a. Boost: consider adding a boost in patients who did not have a boost planned originally
 - b. For hypofractionation: add 1-2 additional fractions if needed
 - c. For conventional fractionation: consider going up to a total dose of 66 -70 Gy if needed.
- 7. Considerations for technology and devices
 - a. Strongly consider omitting bolus material in PMRT setting unless there is significant concern about skin dose (e.g. with use of high energy photon beams, cases with close anterior margins, extensive dermal lymphatic invasion, and/or inflammatory breast cancer)
 - b. ABC technique to be used very judiciously and reserved for cases for which free breathing technique results in cardiac mean dose >4 Gy or lung V20>40%. In general, we should seek alternative approaches to ABC including IMRT/VMAT.
 - c. Aside from select cases in which dose constraints cannot be met through other means, we are generally avoiding use of protons at this time, given that treatment time is significantly longer.
- 8. Tracking Treatment Decisions
 - a. Please make a note in the prescription comment with "P20" (for Pandemic 2020), indicating that the patient's care was somehow altered due to the pandemic. Then add a "note" with the explanation as to what the change was. Consider using these common phrases:
 - i. No use of ABC when I otherwise would have
 - ii. No coverage of internal mammary lymph nodes when I otherwise would have
 - iii. Use of hypofractionation for breast plus RNI
 - iv. Use of hypofractionation for unreconstructed chest wall plus RNI
 - v. Use of hypofractionation for reconstructed chest wall plus RNI
 - vi. Use of hypofractionation for unreconstructed chest wall alone
 - vii. Use of hypofractionation for reconstructed chest wall alone
 - viii. Use of APBI in a cautionary patient when I otherwise would not have
 - ix. Use of alternate fractionation regimen for APBI
 - x. Omission of boost when I otherwise would have
 - xi. Adjustment of dose or fractionation due to treatment break
 - b. Please document in EPIC when you have a discussion with a patient regarding treatment in the setting of COVID 19.

Appendix B. Head and Neck Radiation: COVID-19 Best Practice Guidelines for the Untested Head and Neck Cancer Patient Requiring External Beam Radiotherapy 3/21/2020

- I. **Background:** Increasing evidence supports the conclusion that asymptomatic carriers of COVID-19 can shed viral particles leading to community transmission.¹ In the absence of systematic testing of individuals without symptoms, procedures including examination of the upper aerodigestive tract especially of the nose and nasopharynx where the viral density is considered to be the greatest, can increase the risk of transmission through COVID-19 aerosolization particularly to healthcare providers. This is in addition to the contagious droplet route of transmission due to viral particles remaining on environmental surfaces (plastic/stainless steel [up to 2-3 days], cardboard [up to 24 hours], copper [up to 4 hours], aerosols [up to 3 hours]).²
- II. **Response to COVID-19 Pandemic in the Head and Neck Cancer Patients:** Strategies directed to reducing the risk of community transmission include both social distancing strategies (provider-patient, provider-provider) and efforts to reduce the risk of COVID-19 aerosolization when a head and neck cancer patient requires examination.
 - a. **Social Distancing Strategies:** Social distancing strategies implemented include the following:
 - i. Re-evaluation of the clinical urgency for a face-to-face (F2F) clinic visit by a head and neck cancer patient. This should be performed by the healthcare provider / team of providers who oversee the care of each patient in question.
 - ii. Urgent indications may include the following that justify the risk for both the patient and the care team:
 1. Patients with a known compromised airway due to cancer or treatment with radiation.
 2. Patients with symptoms suggestive of an impending compromised airway due to cancer or treatment with radiation.
 3. Patients with acute treatment complications ie. soft tissue ulcers at risk of bleeding
 - iii. All non-urgent head and neck cancer patients including those needing re-staging of their cancer treatment will be offered either a telemedicine visit or re-scheduling of their F2F clinic visit. If re-scheduling is decided upon, current recommendations would be to reschedule for 2-3 months. However, a monthly re-evaluation may be considered in clinical situations that warrant closer re-evaluations for a F2F visit.
 - iv. Clinical staffing at East Baltimore will transition to a skeleton service. Consult and on-treatment clinical services will be available Monday – Thursday with one consulting provider each day. Should consult services or placement of a dobhoff tube be required on Friday, advanced warranting is encouraged as this will need time to be arranged. Otherwise, this will need to be deferred to the following week.

1. In light of limited ER and inpatient elective support services during the COVID-19 pandemic, enteral nutritional support that is needed for the head and neck cancer patient will be limited to nasogastric enteral support typically with a dobhoff tube.
 - a. To minimize the nutritional impact of head and neck radiotherapy, serial monitoring strategies of the effectiveness of oral intake should be used to guide advanced placement of a dobhoff tube to minimize the nutritional impact. Routine weekly labs are also strongly recommended including magnesium, phosphorus, PAB and CRP.
- v. While clinic is being conducted, all staff and providers should maintain standard social distancing precautions including hand washing x 20 seconds and limit the nature of greetings with each patient visit.

b. Minimizing COVID-19 Aerosolization in the Clinic: These strategies apply to the conduct of the standard head and neck exam including the flexible fiberoptic examination:

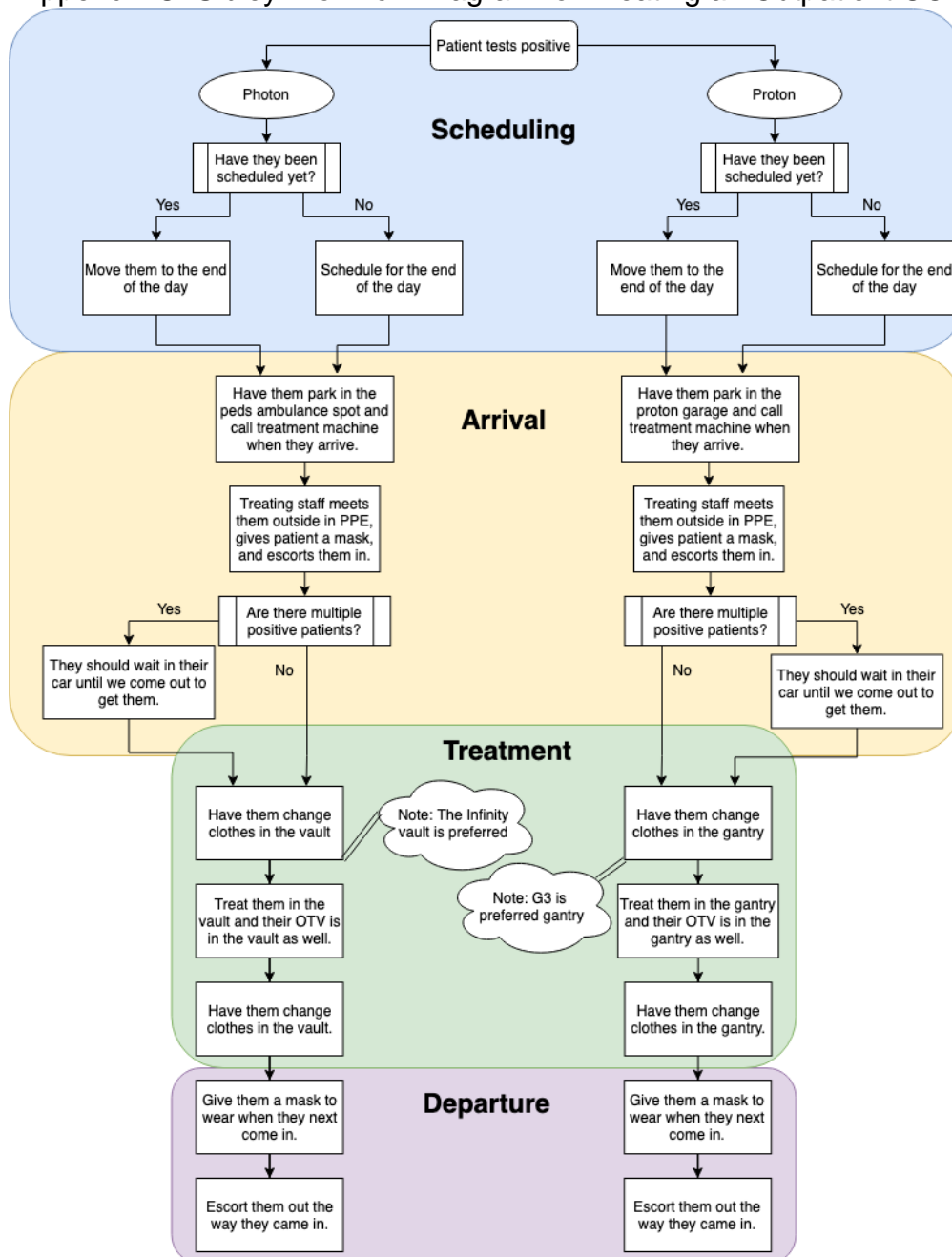
- i. COVID-19 can be aerosolized placing providers and subsequent patients using the same examination room at risk for transmission. As such, additional considerations are warranted. These include:
 1. Modified PPE will be used when a head and neck examination is clinically indicated. Full PPE as recommended by JHU will be used for COVID-19 positive patients.
 2. One or both head and neck examination rooms will be used for patients needing a head and neck exam. Where possible patients not needing a head and neck exam such as patients treated for cutaneous carcinomas, should not use the designated head and neck exam room(s).
 3. Contact surfaces in the head and neck examination room should be cleaned before it is re-used for another head and neck cancer patient.
 4. Topical anesthesia can be administered and ideally through pledgets. Where an aerosol spray is used, this should be used with minimal pressure and risk of creating an aerosol.
- ii. A modified PPE will be used due to limited JHU PPE resources. These will include:
 1. Hand barrier: Disposable gloves will be used for all exams after hand washing x 20 seconds to all surfaces of the hand. After discarding the gloves, hand and forearm washing x 20 seconds to all hand and forearm surfaces is required.
 2. Face barrier: A fitted N95 mask in combination with SPEYE eyewear is current recommended given the limited JHU PPE resources needed for the care of COVID-19 patients. Both the eyewear and the N95 are reusable. Should the eyewear be heavily soiled, the disposable eyeshield can be replaced.
 - a. If a fitted N95 is not available, the provider can defer the examination. If the examination is indicated at the time, a standard surgical mask that is tightly fitted can be considered or deferred to another provider fitted for a N95 mask.

3. Hair barrier: No hair barrier (ie. bonnet or cap) will be required at this time. Providers may wear a surgical bonnet or cap if he/she wishes. Providers with long hair will be encouraged to tie their hair behind their head during the head and neck exam.
 4. Foot barrier: Closed toe shoes are required. No foot covers will be required at this time.
 5. All providers will wear daily laundered surgical scrubs. If additional over / under layers are worn in addition to the surgical scrubs, these additional layers of clothing should be laundered daily as well. No disposable gowns will be used at this time.
 6. All providers will remove hand and wrist jewelry including watches during the head and neck exam.
 7. All providers will be encouraged to wash promptly upon returning home to minimize the risk of transmission.
 8. If a head and neck examination including any upper airway procedure is being performed in a patient with an established COVID-19 diagnosis, standard PPE recommendations by JHU will be used.
- iii. Flexible fiberoptic examinations will be limited to patients with indications for this examination that will operationally change the management that could otherwise not be obtained through imaging. For example, these may include situations where an airway is being compromised due to the cancer / treatment or when there is bleeding that could not be otherwise accounted for by an intraoral examination.
 - iv. When a flexible fiberoptic examination is performed, all efforts should be used to minimize the potential for a patient to mount a prominent gag response to the examination. Technical care in the placement and movement of the fiberoptic scope should be considered including the experience of the person performing the examination.
 - v. Similarly, when a dobhoff tube placement is performed, all efforts should be used to minimize the potential for a patient to mount a prominent gag response to the procedure. Similar considerations regarding the technical expertise of the person performing the placement of the dobhoff tube should be considered.
- c. Minimizing COVID-19 Aerosolization in Head and Neck Cancer Patients Receiving Daily Radiation:** At this time, it is unclear which head and neck cancer patient receiving external beam radiation may increase the risk of asymptomatic transmission to either the radiotherapy care team or to other patients. However, patients with a tracheostomy who have a native larynx and connection throughout the upper aerodigestive tract are at a potential increased risk to create COVID-19 aerosols due to the airway stimulation by the tracheostomy. This cohort of patient warrants additional care consideration in the current COVID-19 pandemic. In contrast, patients with a total laryngectomy do not have an intact upper aerodigestive tract and connection to the nasopharynx and nose. In these patients, the stoma represents airway reconstruction. Recommended best

practices for the head and neck cancer patient receiving external beam radiotherapy include the following:

- i. Head and neck cancer patients with a tracheostomy warrant additional care considerations while receiving their daily radiotherapy treatments. All other head and neck cancer patients without symptoms consistent with COVID-19 or a positive COVID-19 diagnosis should be treated with standard care considerations while receiving radiotherapy.
- ii. Patients with a tracheostomy should continue to be treated as if their airway is completely dependent on the patency of the tracheostomy. However, a subset of patients with a tracheostomy may have a patent airway as assessed by flexible fiberoptic examination while still having a tracheostomy remain in place. For these patients, if they have been successfully verified to be able to cap their tracheostomy by otolaryngology, these patients will be treated with the tracheostomy capped to minimize further risks to providers and subsequent patients given the current COVID-19 pandemic.
 1. The tracheostomy represents both an outer and an inner cannula tube system designed to bypass airway obstruction at the larynx and superior to the larynx. As the tracheostomy is placed in the central trachea, it is prone to the accumulation of mucous and is at risk for complete obstruction.
 2. As such, the inner cannula must be checked for patency before each radiotherapy fraction given that the head and neck patient requires head and neck immobilization with a mask during the delivery of treatment. This not only avoid a potential airway obstruction during the delivery of the radiotherapy, but will reduce the need for the patient to cough when the head and neck immobilization is placed. This will reduce the risk of creating an aerosol in the radiotherapy treatment room. Two options exist to ensure patency of the inner cannula before delivery of radiotherapy:
 3. The inner cannula should be replaced with a clean extra inner cannula by the patient. This should be verified by nursing prior to radiotherapy administration.
 4. The inner cannula requires cleaning and is placed back into the tracheostomy. If this is assisted or performed by nursing, modified PPE should be worn by the nursing staff during the cleaning of the inner cannula.
- iii. Radiation therapists treating patients with tracheostomies where the inner cannula has been verified to be patent are recommended to wear modified PPE when completing the immobilization and setup verification.
- iv. Where possible, head and neck cancer patients with tracheostomies should be treated at the end of the daily radiotherapy treatment schedule. The radiotherapy treatment room should be cleaned for contact precautions.

Appendix C. Sibley Workflow Diagram for Treating an Outpatient COVID+ Patient or PUI



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