

Emerging Practices to Combat Coronavirus Disease (COVID-19): Managing critical supplies

COVID-19 Clinical Knowledge Transfer from Vizient members and industry resources
Updated: May 28, 2020

Vizient is committed to ongoing research of Vizient members' emerging practices and other related updates to federal and regulatory guidelines in support of efforts to combat the COVID-19 pandemic. The purpose of this document is to assist our members with critical information to supplement this work. As new information surfaces, updates will be provided.

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Practice trends

PPE supply remains a concern for hospitals as states reopen and elective surgeries and procedures resume. Continue to monitor your PPE burn rate and evaluate your current PPE conservation strategies.

COVID-19 key strategies roadmap

COVID – 19 Stage	Managing Critical Supplies
Prepare	<ul style="list-style-type: none"> Establish an analytics infrastructure: calculate your anticipated surge with Sg2 COVID-19 Surge Demand Calculator; know your bed and capital capacity, inventory usage and status of PPE and medications for patients requiring mechanical ventilation, renal replacement therapies and respiratory treatments. Assess preparedness level by referencing CDC Checklist for Consumables, Durable Medical Equipment and Supplies and ICU Preparedness Checklists. Review regulatory guidance, including: FDA on Emergency Use of Medical Devices, CDC Strategies for N95 Respirators Optimization, CDC Strategies to Optimize the Supply of PPE and Equipment, CDC Considerations for Pharmacies during COVID-19 and the USP Statement for pharmacy guidance on use of PPE for compounding of sterile products. Collaborate with infection prevention, occupational health and clinical/operational leadership to develop organizational policies and procedures on extending the life, supply and the reuse of PPE and critical supplies. Include policies on visitation, PPE centralization, patient cohorting strategies and device collection procedures. Monitor and secure needed inventory items and critical capital impacted by increased demand, such as ventilators. Consider developing relationships with several suppliers.
Respond	<ul style="list-style-type: none"> Purchase from alternative suppliers if available. Utilize community resources and Vizient COVID-19 Supplies and Equipment Sharing listserv to request supplies you need or offer your surplus inventory. Review GHX cross reference list for managing critical supply alternatives. Operationalize internal plan for PPE conservation as outlined in CDC Strategies to Optimize the Supply of PPE and Equipment regulatory guidelines. Implement extended life or reuse strategies for N95 masks. Where no alternative exists, isolation gowns may also be reprocessed and reused per ALM guidelines. Vet alternate source suppliers to ensure they are reliable using FBI Notice recommendations. Request a product sample for inspection by IC department before committing to bulk orders. Deploy methods to optimize capacity for ventilating patients: utilizing vents based on clinical care guidelines, re-purposing anesthesia gas machines and CPAP machines.
Recover	<ul style="list-style-type: none"> Identify constraints within supply chain availability and develop a plan to mitigate these opportunities. Evaluate your supply chain resilience for potential second wave of outbreak. Factor these findings into your reopening facilities and services plans. Prepare for requests to offset your organization’s financial loss. Identify opportunities, finalize analytics and determine key players to implement cost reduction initiatives. Reorient/train staff on proper use of PPE according to non-crisis level, evidence-based standards of care. Establish solutions for long-term supply accuracy, completeness and resiliency.

Supply shortages, alternate source suppliers and Strategic National Stockpile

Medical Equipment and Supply Sharing List Server

Vizient's medical equipment and supply sharing list server provides our members a trusted and private [platform](#) where they can offer and request critical supplies or medical equipment during the COVID-19 pandemic. This forum is intended for members with a surplus inventory and equipment to donate or share their supplies to members in other areas facing critical needs.

Monitoring supply list for shortages

GHX has provided an updated [cross reference list](#) for managing critical supplies including alternatives. Supplies and equipment to monitor and prepare for shortages:

- Ventilators (critical care and transport), BIPAPs, CPAPs, vent filters, enteral pumps and feeding
- Dialysis machines
- Thermometers
- Portable critical care monitors
- IV Pumps
- IV solutions, IV pump cassette sets, IV standard tubing, IV start kits, IV flushes
- MDI (metered dose inhalers)
- ET tubes
- All respiratory-related consumables (nasal cannulas, tubing, O2 face masks)
- Beds
- Morgue operations and body bags
- Nitrile gloves

Updated 4/23/2020

Alternate Source Suppliers

Vet alternate source suppliers claiming to have N95 masks or other PPE. Request they show the Establishment Registration Number or Firm Registration Number and a copy of the device listing along with the Regulation Number of the specific device.

The FBI issued its [White Notice LIR 200323006 "Criminals Exploiting COVID-19 Outbreak for Financial Gain through Procurement and Consumer Fraud."](#) The notice includes details on markings and where model numbers should be located on the mask.

FEMA has provided a [response](#) to help distinguish between rumors and facts regarding the response to COVID-19. Addresses topics such as "Is FEMA seizing PPE or Re-Routing Medical Supplies When it's delivered to the United States"

Additional information:

- [Options for organizations to report fraud or scams](#)
- [FBI field office information to report fraud](#)
- [FBI fraud submission site](#)

- [Vizient non-contracted alternate manufacturer list](#)

Updated 4/23/2020

Strategic National Stockpile

The AARC has released this [Strategic National Stockpile Ventilator Training video](#). AARC encourages respiratory therapists to be prepared to operate the stockpile ventilators should the need arise.

To obtain products not available through your distributor or contracted supplier, make a request through your state. Be sure to develop a “case for need” for those supplies once they arrive at the state level. Include how many cases you currently have, how many you anticipate needing, how many are currently under investigation and use rate.

- [ASTHO Authorization Toolkit](#)
- [HHS Strategic National Stockpile](#)
- [Strategic National Stockpile: Vizient State by State Guide](#)

Updated 4/16/2020

Facial protection (N95, face shields, procedure and surgical masks)

KN95 respirator Emergency Use Authorization reissued

The FDA has revised the Emergency Use Authorization (EAU) [PPE Letter of Authorization](#) and rescinded approval for numerous disposable filtering facepiece respirators manufactured in China due to performance concerns. A number of previously authorized, non-NIOSH approved FFRs “failed to demonstrate a minimum particulate filtration efficiency of N95 percent” and have been removed from the authorized list in [Appendix A](#). In addition, respirators no longer included in the appendix “may not be reliably decontaminated in any decontamination system authorized for use during the COVID-19 pandemic.”

Added 5/14/2020

KN95 respirator

Some members are sourcing KN95 respirators for potential use in clinical areas. However, the most commonly reported usage of these masks is as a substitute for procedure masks. Before using in this way, ensure there is appropriate filtration level and fitting. Some members are requesting product samples for evaluation and approval from formal committees (e.g. Infection Prevention and Control) before placing orders with vendors.

Updated 5/14/2020

Facial protection protocols

Multiple members have either recently implemented or are implementing universal masking for staff. This is typically combined with an extended use policy, controlled release of masks and patient cohorting strategy. N95 and masking extended use policies are frequently for a “one shift” duration after which staff turn in equipment for reprocessing at designated recycling centers. The “one shift” duration may vary based on role of the health care worker – for instance, an environmental staff member with intermittent interaction with confirmed or suspected patients may reuse the same mask for a longer period of time.

[University of Washington Medicine Extended-Use Masking Policy](#)

Added 4/9/2020

Sterilization and reprocessing strategies

The FDA has issued a [notification](#) regarding the potential risk for health care staff to misinterpret the hydrogen peroxide indicator colors for vapor sterilization, since there is not a standard indicator color to indicate a sterilized device.

Health care facilities alerted the FDA that among manufacturers of hydrogen peroxide vapor sterilization systems:

- The 3M Comply Hydrogen Peroxide Chemical Indicator 1248 uses blue to indicate an unprocessed device and pink to indicate a sterilized device.
- The Aesculap MD334 Process Indicator Card uses pink/magenta to indicate an unprocessed device and blue to indicate a sterilized device.

There have not been any injuries reported to the FDA associated with the use of these indicators.

The FDA has issued [guidance](#) to expand the availability and capability of sterilizers, disinfectant devices and air purifiers. Members should immediately collaborate with infection prevention and clinical teams to establish policies and resources to support reuse and sterilization of items to minimally include: respirators, masks, face shields and isolation gowns. Members should plan ahead for senior leadership support and a physical presence in patient care areas to ensure the collection of equipment from staff for reprocessing.

The [Battelle CCDS Critical Care Decontamination System™](#) is grounded on a study Battelle completed for the FDA in 2016. The system uses concentrated, vapor phase hydrogen peroxide to decontaminate biological contaminants, including SARS-CoV-2. Battelle has validated that CCDSTM technology successfully decontaminates N95 respirators more than 20 times with no degradation of filtration performance. Through a contract awarded by the Defense Logistics Agency (DLA) on behalf of the U.S Department of Health and Human Services (HHS) and the Federal Emergency Management Agency (FEMA), Battelle will provide N95 decontamination at **no charge to health care personnel** as defined in the [EUA](#). To learn more or enroll in this program visit www.battelle.org/n95 and complete the Battelle CCDSTM inquiry form. Battelle will email the information needed to start collecting N95 respirators for decontamination.

PPE sterilization resources:

- [Vizient guide to decontamination methods for filtering facepiece respirators](#)
- [FDA EUA for Steriluent](#)
- [FDA EUA for STERRAD Sterilization Systems](#)
- [FDA EUA for STERIS Sterilization Systems](#)
- [FDA EUA for Battelle Decontamination System](#)
- [University of Nebraska provider resources](#)
- [Guidelines from Journal of Patient Safety](#)
- [ClordiSys decontamination](#)
- [3M statement](#)
- [JAMA Call for Ideas for Conserving PPE](#)
- [N95 Decontamination from N95DECON](#)

Updated 5/14/2020

Self-manufacturing of face shields

Many hospitals are 3D printing or using laser cutting techniques to produce face shields. FDA has issued guidance and a [FAQ](#) related to these practices. In addition, the NIH has released a [supply chain response](#) which represents an effort with the FDA, VA and [America Makes](#) to connect health care providers and 3D printing organizations. The University of Wisconsin-Madison has posted resources related to [face shield production on its website](#) as has [Washington University in St. Louis](#). Members are deploying aggressive strategies to [disinfect and reuse](#) face shields as well as eye protection.

Updated 4/16/2020

Non-NIOSH approved equipment

The FDA reissued a [PPE Letter of Authorization](#) on May 7, which “authorizes disposable respirators manufactured in China, which are not NIOSH-approved, pursuant to certain criteria, including additional validation and review by FDA to confirm the respirator’s authenticity...” Manufacturers of such equipment will be required to confirm the respirator’s authenticity through one of the following criteria:

- It is manufactured by an entity that holds one or more NIOSH approvals for other models of filtering-facepiece respirators (FFRs) produced in accordance with the applicable standards of authorization in other countries that can be verified by FDA.
- It has a regulatory authorization under a jurisdiction other than China that can be authenticated and verified by FDA.
- It demonstrates acceptable performance to applicable testing standards as documented by test reports from a recognized independent test laboratory that can be verified by FDA.

Once a manufacturer of such equipment is authorized by the FDA for distribution, the respirators will be included in [Appendix A](#) under the Emergency Use Authorization, which provides authorization for the respirators to be distributed and used in health care settings when used in accordance with [CDC’s recommendations](#) under this EUA.

Based on available scientific evidence, the [FDA](#) has concluded that certain imported disposable FFRs that are not NIOSH-approved are appropriate to protect the public health or safety.

Updated 5/14/2020

Homemade masks, partnering with local manufacturers and product donations

A number of provider organizations are accepting homemade masks, while others are still restricting sourcing through their standard manufacturing channels. Some organizations are making their own, working with local manufacturers or accepting donated homemade masks.

- [CDC: Updated Guidelines for Crisis Alternate Strategies for N95 Respirators](#)
- [Kaiser NCAL Covid-19 Playbook](#)
- [The Joint Commission Statement on Shortage of PPE](#)
- [The Joint Commission Statement on the use of Face Masks from Home](#)

Updated 4/9/2020

PPE for Sterile Compounding

The [USP Statement](#) discourages the reuse of disposal PPE outside of their best practice standards (i.e. the reuse of a disposable gown for one shift/day) due to the contamination risk; however, USP is not an enforcement agency.

- Due to COVID-19 pandemic shortages, sterile compounding personnel are faced with the option of reused PPE for product protection or none at all.
- Some state boards of Pharmacy (one of the enforcers of USP standard/related state laws) have provided guidance regarding sterile compounding compliance under conditions related to COVID-19 and resultant shortages that allow for USP non-compliant PPE conservation strategies during this pandemic.

Prior to the USP statement, Vizient's USP compliance expert, Katrina Harper provided [recommendations](#) for member pharmacy teams (member log-in required).

Added 3/30/2020

Critical capital and ventilators

Dynamic Ventilator Reserve

The [dynamic ventilator reserve](#) is a public-private effort focused on distributing much-needed equipment to critical areas more efficiently. The new online inventory of ventilators and associated supplies, like tubing and filters, is a collaborative effort led by U.S. hospitals, GPOs and industry partners to support the overall needs of combatting COVID-19.

Hospitals and health systems will use the database to input any available equipment they are able to lend to other facilities. Providers will then be able to access this virtual inventory as their need for ventilators increases. The American Hospital Association will manage the inventory, with full transparency to those participating. In addition, the AHA will work with FEMA should this virtual inventory be needed to supplement the Strategic National Stockpile.

Added 4/20/2020

Critical Care Preparedness - Supplies

- Supplement full-featured ventilators – use BiPAP machines capable of functioning as a ventilator, transport ventilators, and anesthesia machines
- Consider placing new patients on full-featured vents to titrate management and more stable patients on other ventilator strategies
- Consider how BiPAP and high-flow nasal cannula strategies will be used and how those patients will be closely supervised for deterioration, as it can be rapid (anecdotally, from stable to critical in a few hours). These strategies may generate more aerosols, therefore staff in these areas may need higher levels of PPE. An open pre-induction or other space may be helpful to observe several of these patients in a defined area.
- Be prepared to do high-level disinfection on ventilator circuits, oxygen delivery equipment, and other disposables
- Have adequate sedation and analgesia medications available
- See [Critical Care Planning – COVID-19 Quick Notes](#) for more information

Added 4/20/2020

Hemodialysis and Renal Replacement Therapy (RRT)

Critically ill COVID-19 patients are increasing the demand for RRT equipment and supplies. Evaluating your RRT capacity and options for obtaining additional equipment and supplies may be necessary. Dialysate solutions, replacement fluids and anticoagulants will need to be monitored.

Added 4/23/2020

Infusion Pumps

COVID-19 patients may require continuous infusion of medications, nutrition or other fluids. To ensure adequate supply of infusion pumps and accessories, the FDA has issued guidance to help expand the availability and remote capabilities of these supplies during the COVID-19 pandemic. [This document](#) notes the FDA will not object to limited modifications to the indications, functionality, hardware, software, design or materials of devices used to support patients requiring continuous infusion therapy.

Added 4/9/2020

Ventilators

HHS provided [guidance](#) on critical care planning for COVID-19 including plans to supplement full featured ventilators by using a BiPAP machine, strategies for BiPAP and high-flow nasal cannula, disinfection on ventilator circuits, oxygen delivery equipment and other disposables.

As demand for ventilators increases, Vizient is closely monitoring the demand of ventilator-related medications required to support patients on ventilators and investigating ways to help members anticipate and manage the increase. Vizient's Pharmacy Solutions team has developed a [tool](#) to accurately project demand for ventilator medications over a four-week period by drug and drug class. Vizient is providing mitigation strategies for ventilated medications, including [sedation agents](#), [paralytics](#) and [analgesic agents](#).

In addition to the [ventilator medication demand tool](#) used to accurately project demand for ventilator medications, Medtronic and other leading ventilator manufacturers joined to form the **Ventilator Training Alliance (VTA)**. The alliance is an industry-wide effort to provide health care professionals one central location for training across many ventilator models.

The VTA has launched an [app](#) with ventilator training resources including:

- How-to videos
- User guides
- Equipment manuals
- Troubleshooting guides
- Other ventilator-operation expertise

The training material was provided by alliance members Dräger, GE Healthcare, Getinge, Hamilton Medical, Nihon Kohden and Philips, Medtronic and Vyaire. Additional companies are expected to join the alliance in the coming weeks. COVID-19 has increased the demand for respiratory therapists and where there are shortages, nurses and other medical professionals can find on-demand training.

Many organizations are discussing and/or already sharing ventilators to mitigate shortages and improve access to this necessary equipment. Statements from the [American Association for Respiratory Care \(AARC\)](#), [Society of Critical Care Medicine \(SCCM\)](#), [American Society of Anesthesiologists \(ASA\)](#), [Anesthesia Patient Safety Foundation \(APSF\)](#), [American Association of Critical-Care Nurses \(AACN\)](#) and [American College of Chest Physicians \(CHEST\)](#) were released March 27 **against the use of ventilator sharing**.

They argue that this should only be done in a “last-ditch effort” after careful consideration and in consultation with the Ethics committee/Institutional Review Board, and recommend other options in the [AARC statement and guidance document](#).

The [FDA recommendations](#) for mitigation strategies were released on March 22, while HHS issued [guidance](#) for optimizing ventilator supply and usage on March 31.

Many members are repurposing anesthesia machines, CPAP and BiPAP devices as ventilators; however, these efforts require direct collaboration with anesthesiologists and respiratory therapists for extensive advanced planning and ongoing execution. Medtronic has posted [open-source ventilator product specifications](#).

Updated 4/30/2020

ECMO

ECMO may be offered for patients with refractory hypoxemic respiratory failure/acute respiratory distress syndrome (ARDS) due to COVID-19. The WHO has established [guidelines](#) for utilizing ECMO when COVID-19 is suspected. Organizations should consider:

- **How** to prioritize and allocate ECMO resources.
- **When** the organization’s response strategy should include use of ECMO.
- **What** personnel and equipment will be needed.
- **How** to mitigate shortages of ECMO since alternatives are more limited.

See newly published literature from The Lancet on [Planning and provision of ECMO services for severe ARDS during the COVID-19 pandemic and other outbreaks of emerging infectious diseases](#) and from JAMA Network on [Preparing for the Most Critically Ill Patients With COVID-19: The Potential Role of Extracorporeal Membrane Oxygenation](#).

Added 3/31/2020

PPE conservation, utilization and reopening strategies

Infectious Diseases Society of America (IDSA) [Guidelines](#) on Infection Prevention in Patients with Suspected or Known COVID-19

The IDSA released new guidelines on N95 use, extend and reuse for PPE, utilizing a GRADE methodology with recommendations listed as strong or conditional. Moreover, the guidelines tailor recommendations to the availability of supplies with guidance on appropriate use according to conventional, contingency and crisis capacity standards. Among the eight recommendations: clinicians in a conventional setting may use either a surgical mask, N95, or N99 or PAPR for routine patient care—or either a surgical mask or reprocessed respirator in a contingency or crisis setting. Additionally, in a setting with contingency or crisis capacity: clinicians should use a reprocessed N95, not a surgical mask, for procedures that generate aerosols. They can add a face shield or surgical mask to an N95 for extended use.

Added 5/7/2020

CMS [Guidance](#) on reopening with reference to PPE and supplies

Consistent with CDC’s recommendations for universal source control, CMS recommends that health care providers and staff wear surgical face masks at all time. Procedures with a higher risk of aerosol transmission and on the mucous membranes should be done with great caution and staff should utilized appropriate respiratory

protection such as N95 masks and face shields. Patients should wear a surgical mask or a cloth face covering that can be brought from home.

Added 4/23/2020

PPE conservation and utilization strategies

Surge supply projections vary widely by provider organization and depend on a number of factors. Organize preparations for key product categories through a structured approach, anticipating key variables below as follows.

Reducing utilization: ++ Impact

- Partner in planning clinical protocols and patient cohorting strategies (i.e. COVID/Non-COVID, remote tele-monitoring or phone/two-way intercom, videoconferencing or baby monitors, vent screens/IV tubing extensions/bed monitors outside room, negative pressure rooms).
- Plan for patient acuity: low risk, minimum PPE, high risk most protective PPE, etc.
- Confirm occupational health protocols (i.e. universal masking, variability in PPE use by unit or role – for instance, EVS workers v. direct patient care).
- Limit and centralize access to PPE: Visitor restriction, PPE inventory centralization, elective surgeries and office visits cancellation/telehealth.
- Anticipate PPE product combinations to support conservation (i.e. mask or face shield over respirator for combined particulate and droplet protections).

Reuse: +++ Impact

- Pivot utilization assessment toward provider/shift, instead of patient – i.e. one respirator per shift, instead of one respirator per patient encounter.
- Determine policies for either the **extended use or limited reuse** of PPE (i.e. “one mask” and, perhaps, “one respirator” per shift or use until visibly soiled/failure, multiple healthcare providers sharing one gown).

Reprocess: ++++ Impact

- Identify the scope and strategy of internal and external reprocessing with a mindfulness that various techniques have a varying impact on product durability and integrity (i.e. H2O2 v. UV light). Recent EUAs from the **FDA** have created new options for providers in the last several weeks, as well (i.e. **Battelle**, **ASP**, **Steris**).
- Develop policies and a plan for equipment collection to optimize implementation of reprocessing strategy (i.e. physical presence on patient care units to collect equipment for reprocessing each shift, no make-up policy) – members estimate that, roughly, 80% of reprocessed product can be reused. No make-up policies are crucial to ensuring product can be reprocessed.

Added 4/23/2020

Gown Conservation

The CDC has published **strategies** to optimize supplies of isolation gowns. Highlights include:

- Contingency Capacity Strategies
 - Selectively cancel elective and non-urgent procedures and appointments for which a gown is typically used by HCP
 - Shift gown use towards cloth isolation gowns (review appropriate **laundering procedures** for reuse of gowns)

- Consider the use of coveralls (see [NFPA 1999](#) for standards related to coveralls)
- Crisis Capacity Strategies
 - Cancel all elective and non-urgent procedures and appointments for which a gown is typically used by HCP
 - Extended use of isolation gowns can be considered only if there are no additional co-infectious diagnoses transmitted by contact (such as *Clostridioides difficile*) among patients
 - Prioritize gowns to be used for specific care activities (e.g. aerosol-generating procedures) and high-contact activities with patients (e.g. dressing, showering, transferring, providing hygiene, changing linens)
- When No Gowns Are Available
 - Consider using gown alternatives that have not been evaluated as effective such as disposable laboratory coats, washable patient gowns, washable laboratory coats, disposable aprons, to name a few

The Association for Linen Management (ALM) has released [interim guidance](#) for reprocessing disposable single-use protective gowns. The guidance is intended to provide a stop-gap measure to supplement the provision of gowns to provide an alternative to the absence of any cover apparel during the COVID-19 pandemic. **Please note: the guidance does not produce a gown that meets the required barrier standards for which it was initially manufactured and may be labeled, and no gown provided under the guidance should be used in a surgical procedure, per recommendation from the FDA.** Any laundry intending to use this interim guidance is strongly encouraged to review the [Considerations for Laundries Implementing](#) document prior to undertaking this guidance.

Added 4/23/2020

Allocating scrubs to clinical staff

Some members are providing scrubs to staff directly caring for COVID-19 patients, following protocols to ensure the scrubs are properly doffed at the facility and laundered. They noted this has placed a strain on laundry services. Conversely, other members have not enacted universal distribution of scrubs to all staff members, citing policies identifying facial protection, gloves and gowns as appropriate PPE for COVID-19 patients.

Added 4/16/2020

PPE recommendations for pharmacists

The CDC updated [Considerations for Pharmacies during the COVID-19](#) to include new information regarding face coverings for outpatient pharmacies staff and customers.

Added 4/20/2020

Remote monitoring to preserve PPE

Use remote interaction with patients in isolation as appropriate to conserve PPE:

- Remote telemonitoring equipment if available.
- Utilize phone or two-way intercom.
- Video conferencing or baby monitors.
- Some organizations are moving IV pumps and vent screens outside the door into the hallway and running IV tube extension sets to the patients to reduce the amount of PPE used.

Added 3/31/2020

PPE burn rate

Know your **PPE burn rate**. COVID-19 patients will significantly increase the normal rate; however, be aware these analyses are highly-contingent on clinical protocols and conservation strategies which vary widely across provider organizations.

- [CDC Template for Calculating PPE Burn Rate](#)
- [HHS Template for Calculating PPE Burn Rate](#)

Baseline considerations in projecting surge supply utilization:

- # COVID-19 PUI – lab test turnaround times
- # COVID-19+ patient acuity – non-vented & vented
- # of staff interactions and # of shifts
- PPE category specific utilization, i.e. face shields vs. disposable gowns
- Utilization of key conservation strategies, including reprocessing

Consider patient categories and cohorts to **project total daily use per patient**, for instance, by supply category:

- Category 1: ICU patient or aerosolizing procedure/case: X caregivers per patient * Y PPE exchanges per day
- Category 2: Non-ICU patients: X caregivers per patient * (Y-Z) PPE exchanges per day

Added 4/23/2020

Hand sanitizer

[FDA Policy for Temporary Compounding of Certain Alcohol-Based Hand Sanitizer Products during the Public Health Emergency](#)

Practices shared by Vizient members for **hand sanitizer conservation**:

- Redistribute from non-clinical areas to clinical areas.
- Pull product from non-clinical areas that are now working from home.
- Remove product from non-clinical areas that are still working on campus but leave one full bottle for every three or four staff/desks.

Added 3/30/2020

Blood products

Prepare for possible reduction in blood supply due to reduced blood drives.

- Recommend that elective surgeries be cancelled.
- Adhere and enforce transfusion guidelines by communicating short supply.
- Remind clinicians to test pre and post transfusion to ensure the transfusion is clinically indicated.
- Cell salvage is recommended except where there are contraindications.

Added 3/30/2020

Supplier resources

Suppliers and Distributors with dedicated COVID-19 websites as a resource for their customers:

- [Cardinal Health](#)
 - [Henry Schein](#)
 - [McKesson](#)
 - [Medline](#)
 - [Owens & Minor](#)
-

Additional resources

- [Vizient Pharmacy Solutions for COVID-19](#)
- [Vizient Masks and Respirators Clinical Resource Guide](#)
- [Duty to Plan: Health Care, Crisis Standards of Care and COVID-19](#)
- [JAMA: N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel](#)
- [WHO: Rational Use of Personal Protective Equipment for Coronavirus](#)
- [CDC: Checklist for Healthcare Facilities: Strategies for Optimizing the Supply of N95 Respirators during the COVID-19 Response](#)

Updated 5/7/2020

Additional emerging practices

Access resource documents on other topics.

- [Emerging clinical practices and evidence](#)
- [Surge capacity](#)
- [Staff impact](#)
- [Testing](#)
- [Visitation](#)