



THE HOUSE OFFICER'S HANDBOOK (20TH EDITION)

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Foreword

This handbook was pioneered in 1998 by Dr Gregory Leong Goh Han as a tool to ease the transition from a medical student into the role of a House Officer. Housemanship is probably the toughest phase in one's medical career as the expectations and demands (from medical staff and patients) escalate steeply. It is also a physically and mentally exhausting stage.

Creating a generic House Officer's Handbook aims to provide an orientation of the roles and duties of a House Officer and to equip oneself with practical tips on daily work and call duties. Setting a common platform helps to streamline the student-internship experiences of graduates from the 3 local medical schools and international medical graduates. The content is relevant to all specialties and will complement the respective departmental handbooks.

2020 has been an unprecedented year with the COVID-19 pandemic stressing healthcare systems worldwide. Even the Secretary-General of the United Nations (Antonio Guterres) described this as the worst humanity crisis since World War II. The resilience and courage displayed by every healthcare worker exemplify the calling of medicine - "I SOLEMNLY PLEDGE to dedicate my life to the service of humanity" (Declaration of Geneva). Our united bravery will triumph at the end of this long-drawn campaign.

I present to you the latest edition of the House Officer's Handbook which will not be possible without the fantastic partnership of the Doctors-In-Training members from all 3 Sponsoring Institutions – Dr Dorinda Chew, Dr Lee Tung Lin, Dr Wang Zhemin and Dr Daniel Hap.

Once again, congratulations on passing your final medical examinations and obtaining your license to practice. I warmly welcome you to join the medical fraternity at this significant moment, and we will battle alongside with you, hand-in-hand. I hope that this handbook will serve you well and I wish you all the best in your budding career.

Dr Benny Loo
Chairperson
SMA Doctors-In-Training Committee

1. Introduction to Life in Singapore's Hospitals

The system is similar across the different healthcare clusters, whether it is NHG, NUHS or SingHealth.

a) **The Hierarchy**

- i) **House officer (HO) – You:** Look after a few patients and try to know them well as you're often the first person to be approached by nurses, pharmacists, allied health professionals, etc regarding patients. You are usually the first person to speak to patients' family. Besides that, it is also your role to coordinate and facilitate discharge matters, with the help of nurses and medical social workers if necessary
- ii) **Medical officer (MO):** They may be in charge of their own patients, but would have an idea of your patients as well so feel free to approach them with questions
- iii) **Registrar:** The small boss who knows all the patients and leads the round
- iv) **Consultant/Senior Consultant/Prof:** The big boss

b) **Team Based vs Ward Based**

The system structure depends on your specialty and hospital, though the hierarchy still applies in both team and ward based systems.

- i) **Team based systems:** Your team stays together for a month or longer. Patients are assigned to your team and they stay with you until they get discharged or transferred to other providers. Hence you tend to have patients in different locations and wards.
E.g. SGH DIM, CGH IM, GS in all hospitals.
- ii) **Ward based systems:** You are assigned to cover almost all the patients of a certain ward for a specific duration of time. You can be dispatched to other wards for day(s) depending on manpower needs. The coverage can be further divided into morning and afternoon coverage, which may differ across institutions.
E.g. KKH O&G/ Paediatrics, GM in most hospitals

c) Administrative Stuff

- i) Most department secretaries will send you a welcome email nearing the time you are scheduled to begin the posting.
- ii) You should also receive a roster indicating which teams and wards you are posted to.
- iii) You can check with your fellow HOs, who have been in the department longer, for the essential tips about the department, how the teams work and how the call system functions. You can also contact your MOs who would be able to add you to the team Whatsapp/ Tiger-Text group
- iv) In accordance with the Personal Data Protection Act 2012 (PDPA), MOH has mandated for all healthcare staff to use **TigerText** when communicating and sharing confidential information. This is a mobile application that can be downloaded and instructions will be given on how to download this application when you start work.
- v) Changeover dates are when everyone changes to different teams. HOs tend to have different changeover dates from MOs, registrars and consultants so as to facilitate the handover process. This change in teams usually happens once a month.
- vi) Many departments have an orientation programme for new HOs which may or may not be after your morning duties.
- vii) You will also need to collect essential items such as your name tag, name chop, and access pass.

2. Day to Day Work

a) Pre-rounds

Objective: Review the patient with the following items before the actual rounds.

- i) Vitals and input/output chart
- ii) Investigation results and medication chart
- iii) Any overnight events
- iv) In GS/ Ortho, part of your pre-round duties involves updating the **team list**:
 - This is a list containing all the patients under your team and their location, issues, results and management plans.
 - It is extremely important to prepare and print out sufficient copies in time for morning rounds.
 - The list is usually updated twice daily, and would be available on Google Docs or in a central server.

Medical Specialty	Surgical Specialty
0630hrs (Pre-round): Review past medical history, history recorded on admission, investigations and vital signs, input/output charting. All these are to be charted and synthesised on a clerking sheet. Review the patient and take a complete history and physical examination.	0600hrs (Pre-round): Locate all the patients under your team in the hospital; ensure that the locations are accurate. Review past medical history, investigations and vital signs. These are to be compiled for all patients onto the team list. Unless the patient is acutely sick, you may not need to review the patient just yet.
0800hrs (Rounds): Registrar or consultant will review the patient with you. You are to present the complete history, physical examination and background that you had done earlier.	0730hrs (Rounds): Team registrars and consultants will arrive to review each patient with you. You should try to take a brief history from each patient if time permits.
<p>Ensure privacy for the patient during examination by drawing the curtains around the bed. Prepare the computer on wheels (COW) and any other materials necessary for physical examination such as gloves and tendon tappers.</p> <p>It is important to document according to the SOAP format (Refer to table in page 8), and any important conversation that has been made with the patient.</p>	
<p>Time to do changes: Urgent changes must be prioritised; discharges and referrals to be made before lunchtime. Then proceed to do non-urgent changes and trace results to prepare for exit rounds in the afternoon. (Refer to section on Changes and Referrals, pages 8)</p>	
<p>After exit rounds, note which patients are sick and will need to be highlighted via a handover to your colleague who will be on call. (Refer to section on Handovers, page 19)</p>	

Most teams prefer to use the SOAP format to organise documentation during rounds. The suggested SOAP format for daily ward round documentation is as such:

Ward Round SOAP Format	Example
<p>Seen by: Date: Time: Medications: - No. of days of significant medication (e.g. antibiotic)</p>	<p><i>Seen by: Dr Lim (Consultant/ Registrar)</i> <i>Date: 01/01/2020</i> <i>Time: 0700hrs</i> <i>Medications: D3 IV Tazocin</i></p>

	<p><i>(Medication/Intervention)</i></p> <ul style="list-style-type: none"> - <i>Hold IV drip</i> - <i>Keep NBM</i> - <i>Continue IV Tazocin</i> <p><i>(Monitoring)</i></p> <ul style="list-style-type: none"> - <i>Q2H Vitals + SpO2</i> - <i>Strict input/output chart</i> <p><i>(Referral)</i></p> <ul style="list-style-type: none"> - <i>Refer to Cardiology for possible Acute Myocardial Infarction</i> <p><i>(Others)</i></p> <ul style="list-style-type: none"> - <i>Family conference at 2pm</i>
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b) Rounds

- i) The duration of each round varies depending on the registrar and consultant in charge. As a HO, you can expedite rounds by:
 - Ensuring the computer has opened all the results, relevant imaging required and blue letter replies.
 - Knowing the patients under your care well so that you're prepared to answer any questions from the registrar and consultant.
- ii) Obtain the patient's case file, vitals and input/output chart. It is good to know where they are kept, so you can retrieve them faster.
- iii) Present the cases
 - As a HO, you may be required to clerk new cases.
 - New cases (i.e. patients admitted overnight on call): know their presenting complaint, background (e.g. Past Medical History, Medications List), physical findings, preliminary investigations and impression, and initial plan.
 - Old cases: any overnight events, new results, new complaints and physical findings, and plan for the day.
- iv) Be prepared to answer questions as some senior doctors enjoy teaching during rounds, especially if medical students are around.

- v) Document any decisions, instructions, important history or physical findings in the notes.
- vi) Document any conversations with patient and/ or family members during the rounds too.

c) Changes

As a HO, you may be expected to do many things after rounds. Hence, it is important to prioritise urgent changes first. In general, the order goes like this:

Urgent Changes	Passive Changes
<ul style="list-style-type: none"> ● Definition of URGENT changes: Things that your registrar and consultant asks you to do NOW. It can even be done during rounds. ● Urgent scans or referrals: You will need to call the radiologist or specialist on call, and get it arranged as soon as possible. You need to know the indication for the scan or referral, with relevant history and investigations (refer to pages 21 and 22). ● Referrals: Different hospitals have different cut off times for referrals, but the general rule is that referrals should be made before 11.30am on the same day. ● Discharges: Different hospitals also have different cut off times for discharges, but once again, most discharges in the morning should be done by noon/ lunchtime. 	<ul style="list-style-type: none"> ● Calling the laboratory for urgent results that will affect the management of the patient. ● Taking blood, setting IV plugs, ordering medications, removing drains, inserting indwelling urinary catheter (IDC). ● Tracing up on results on the system, highlighting any abnormalities to your seniors. ● Updating family, assessing for potential social or discharge difficulties. ● Evening discharges, usually to be done by 5pm. ● Applications for Agency for Integrated Care (AIC) subsidies ● Pre-discharges, tracing old notes and past medical history.

d) Referrals

- i) You would frequently have to call the registrar on call or the blue letter Reg that you will be referring to. Hence, the blue letter should summarise your thoughts and the case well so as to help you when presenting and referring to the registrar.
- ii) You could ask your senior what is the main purpose of the referral and clarify if in doubt, such as what are the important negative examination findings to highlight.

Referral Letter Format	Example
<p>From: Name/Specialty To: Name/Specialty</p> <p>Reason of referral:</p> <ul style="list-style-type: none"> - Identify the main reason(s) for the consult <p>Summarised history:</p> <ul style="list-style-type: none"> - Biodata - Admitting complaint - Significant past medical/social/family history - Current medication and drug allergy <p>Examination findings:</p> <ul style="list-style-type: none"> - Highlight positive and significant negative findings <p>Results:</p> <ul style="list-style-type: none"> - Highlight relevant or significant results 	<p><i>From: A/Prof John Tan (General Medicine) To: Prof Louis Tay (Neurology)</i></p> <p><i>Reason of referral:</i></p> <ul style="list-style-type: none"> - <i>Management of newly diagnosed stroke</i> <p><i>Summarised history:</i></p> <ul style="list-style-type: none"> - <i>Mr David Ong is 62 year old Chinese man</i> - <i>He presented with left-sided weakness and numbness 2 days ago</i> - <i>He has a history of atrial fibrillation and there is a family history of stroke</i> - <i>He has been smoking 1 pack per day for the past 10 years</i> - <i>He is currently on aspirin 100mg OM and there is no drug allergy</i> <p><i>Examination findings:</i></p> <ul style="list-style-type: none"> - <i>Vital signs showed blood pressure of 180/100mmHg</i> - <i>His pulse is irregularly irregular</i> - <i>There is right upper motor neuron facial nerve deficit</i> - <i>There are upper motor neuron deficits of the left upper and lower limbs</i> - <i>He walks with a left hemiplegic gait</i> <p><i>Results:</i></p> <ul style="list-style-type: none"> - <i>MRI brain showed hyperintensity in areas of left middle cerebral artery on diffusion weighted imaging (DWI)</i>

Provisional diagnosis: <ul style="list-style-type: none"> - Suspected diagnosis (hence the referral) - Clinical concerns Others: <ul style="list-style-type: none"> - Highlight any other details (e.g. patient's preference) Written by: Name/Signature (for Consultant) Date/Time: Contact detail:	Provisional diagnosis: <ul style="list-style-type: none"> - Left stroke Others: <ul style="list-style-type: none"> - Patient request not to disclose his diagnosis to his family members Written by: Dr Sarah Wong (for A/Prof John Tan) Date/Time: 01/01/16, 1100hrs Contact detail: 9123 4567
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e) Discharge Documents

Pre-discharge: Whenever you have free time, try to fill in the discharge summary beforehand so it's easier to discharge the patient when the time comes

Discharge Summary Format	Example
Patient biodata: Name, NRIC number, age, gender, drug allergies, smoker/drinker, premorbid status (ADLs), who patient stays with	Patient biodata: Peter Pang S0099887M 42yo/M/Chinese ADL-assisted, wheelchair bound Lives with Brother NKDA
Past medical and surgical history	Past Medical History <ol style="list-style-type: none"> 1) Road traffic accident 2000: Pedestrian; suffered a traumatic T10 spinal cord injury s/p intervertebral body fixation. 2) Urinary tract infection 2003 (E. Coli pansensitive s/p antibiotics)
Presenting complaint	Presenting complaint <ol style="list-style-type: none"> 1) Fever <ul style="list-style-type: none"> - Tmax 39 degrees, with chills and rigors - No headache/blurring of vision/dysuria/limbs swelling/cough/sore throat/rashes/joint pain - Brother also has diarrhoea, but mild, after taking food from same source; no travel 2) Vomiting, diarrhoea x 1 day <ul style="list-style-type: none"> - Non-bilious non bloody vomitus, a/w mild epigastric discomfort 6 times - Non bloody non mucoid diarrhoea 5 times - Last OGD/colonoscopy done 2006: NAD

Good to include: - Medication changes	<i>No medication changes. Patient was discharged well on [date]</i>
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f) Memo

A memo is required when the patient has follow up to other specialties, hospitals or GP/ OPS (Polyclinic). It should comprise a simple summary of patient's background, why we are referring the patient to them and what they need to do.

Example

From: Department of General Medicine

To: OPS/GP

Dear Colleague,

Thank you for seeing patient Madam Tang Yong Ya, S1122334P.

She is a 68yo lady who was admitted to Tan Tock Seng Hospital on 07/09/2001 for hypertensive urgency.

She has a past medical history of hypertension, hyperlipidemia and chronic kidney disease with baseline serum creatinine 130.

Her hypertensive medications were titrated, and she was discharged well on 11/09/2001.

There were medication changes made to control her blood pressure:

Nifedipine LA 30mg OM increased to 60mg OM.

Please assist us to review her blood pressure control.

Thank you for assisting us in the management of this patient.

Regards,

Dr Jennifer Law

On behalf of Prof Ang YK

g) Medical Certificate (MC)

Certain hospitals have guidelines as to how many days MCs can be, so the number of days you can prescribe varies accordingly.

h) Prescribing Medications

- i) Check through patient's medical history and drug interactions when prescribing discharge medication. If unsure, confirm with seniors how many days you should prescribe certain medications. If they are unsure, you can always call the pharmacist on-duty to ask for advice.

- ii) E.g. Complete 1 week of antibiotics vs Discharge with 1 week of antibiotics; the former means you have to count how many days of antibiotics patient has received inpatient and prescribe only the remaining number of days, while the latter just means what it means.

i) Communicating with Your Team

- i) Most teams communicate through Whatsapp/ TigerText. This makes it easy for us to inform our seniors of any major occurrences.
- ii) In ward-based systems, however, the people covering the ward can change from day to day, hence you may need to check the roster to see who is scheduled to cover that day.
- iii) If you will not be covering the same patients the next day or they are to be transferred to another ward for further care, it is important to handover the case to your colleague either verbally, via text or a brief written summary. This is to ensure patient care continuity.

j) Communicating with Others

You may sometimes need to scribe the discussions between physicians and family members etc.

Communication Record Format	Example
Date: Time: Location: Medical team (attending): <ul style="list-style-type: none"> - Include doctors, nurses, allied health professionals, medical social workers - Family members (attending): <ul style="list-style-type: none"> - Include name and relation to patient Discussion: <ul style="list-style-type: none"> - Concise summary of topics discussed 	<i>Date: 01/01/2016</i> <i>Time: 1400hrs</i> <i>Location: Ward 34 Meeting Room</i> <i>Medical team:</i> <ul style="list-style-type: none"> - <i>Prof Tan XY, Dr Wong JH, SN Teo MM, Ms Sarah Tan (physiotherapist), Mr Dan Chan (medical social worker)</i> <i>Family members:</i> <ul style="list-style-type: none"> - <i>Mr Wong CM (spouse), Mr Jon Wong (son), Ms Denise Tan (sister)</i> <i>Discussion:</i> <ol style="list-style-type: none"> 1) <i>Treatment options</i> <ul style="list-style-type: none"> - <i>Medical...</i> - <i>Surgical...</i> - <i>Conservative...</i> 2) <i>Aim of treatment</i> <ul style="list-style-type: none"> - <i>Curative...</i> - <i>Reduce morbidity...</i> - <i>Palliative...</i>

<p>Conclusion/Follow-up:</p> <ul style="list-style-type: none"> - Conclusion of discussion - Joint decisions - Follow-up plans for medical team - <p>Next meeting (if applicable):</p>	<p>Conclusion/Follow-up:</p> <ul style="list-style-type: none"> - <i>Family opted for conservative management</i> - <i>Medical team to prepare medical summary for family to seek 2nd opinion</i> <p>Next meeting: 01/02/2016</p>
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k) Communicating Patient's Resuscitation Status

This is one of the trickiest tasks for junior doctors to do, and will need a lot of guidance and practice. Usually these final decisions will be counseled and the form will be signed by a more senior doctor, but house officers can also initiate the conversation to give the family some time to think about it early on. Please check with your respective hospital policies on DNR for patients.

In general, there are 3 types of resuscitation statuses: Active, DNR max ward and DNR comfort care, which will take effect when a patient deteriorates rapidly.

- i) Active: Full resuscitation that includes CPR, Intubation and ICU management
 - This status is conferred to patients with good pre-morbid status and a good chance of successful outcomes from ICU management.
- ii) DNR max ward: Supportive treatment with non-invasive resuscitation. This includes fluid resuscitation, escalation of antibiotics, increased oxygen supplementation, and possibly administration of inotropic support.
 - This status is usually recommended in patients who have poor pre-morbid status or multiple comorbidities that would predict poor outcomes should active resuscitation be started.
- iii) DNR comfort care: Supportive measures to keep the patient comfortable in spite of deterioration. Blood taking may be stopped and medications such as antibiotics may be discontinued if patients are not responding. In these patients, strong painkillers and medications to reduce secretions could be prescribed, to allow the patient's passing to be easier.
 - This status is conferred to patients with terminal illness and expected demise.

Several approaches are available to initiate such a difficult conversation to counsel for DNR max ward status:

- i) Enquire about the patient's wishes in the event of a serious medical condition;
- ii) Explain the current severity of the patient's condition;
- iii) Review the patient's medical history with the family and agree that the patient is pre-morbidly not the best candidate;
- iv) Recommend that the patient would benefit most from DNR max ward management in view of the pre-morbid status. Measures will include things such as maximising fluid resuscitation, escalation of antibiotics and oxygen supplementation in the ward. Explain that the patient's outcome will depend on the body's response.

****Tip:** If you are uncomfortable or feel unsuitable to discuss resuscitation status, please refer to your senior as this task is expected of and usually done by senior doctors. You can however sit in during the discussion to learn how this is being done as you will be a senior to a House Officer or Medical Student in the future!

I) Taking Consent

- i) In certain hospitals and departments, HOs are allowed to take consent for minor procedures
- ii) Commonest consent taken is for blood transfusion
 - Indication for blood transfusion: Most commonly anaemia
 - Risks of blood transfusion
 - Risks of contracting blood-borne diseases: These diseases include HIV, Hep B, Hep C. However, the risk is low (don't quote the numbers if you aren't sure) because of the thorough checks and screens that the national blood banks carry out.
 - Risks of transfusion reaction: Reactions can be mild such as fever or rashes, which can be treated symptomatically as well as by stopping the transfusion. Severe reactions include anaphylaxis and TRALI, which require immediate termination of the transfusion and to start resuscitation. Inform the patient of signs and symptoms to look out for during transfusion.

- iii) Usual duration for the transfusion is 4 hours per pint, with a recheck blood test to be done after the entire transfusion is complete.

****Tip:** Some hospitals have specific consent forms for certain procedures or patient information sheets on their intranet. As a new HO, you can ask your fellow colleagues where to find them and then, use these forms to help guide your consent taking. Good luck!

m) Operating Theatre (OT) Chit

- i) Sending an OT chit is an essential skill for surgical HOs so as to inform the operating theatre that a patient is prepped for surgery.
- ii) Chits are usually divided into elective and emergency in nature.
- For elective chits, patients have already been put on the OT list, and all you need to do is inform the OT that the patient is ready for surgery by sending the chit.
 - For emergency chits, patients are not listed beforehand. Sending a chit means putting them on the waitlist for the emergency OT.
 - Important information to obtain in order to complete the OT chit: time of last meal, P1/P2/P3 case (how quickly the emergency case needs to be done, which you can ask your senior), complete description of the operation, who is the surgeon, patient's comorbid, which OT (usually emergency OT), when was the latest GXM done.
 - Frequently, you will need to call to inform the anaesthetist of the emergency case.
- iii) Different hospitals have different methods of sending OT chit. Check with your seniors.

n) Preparing for Operation (PFO)

- i) Bloods must be ready and corrected – FBC, RP, PT/ APTT, GXM
- ii) May require standby blood transfusion
- iii) ECG, CXR
- iv) Ensure Anaesthesia reviews and obtains consent from patient
- v) NBM 12 midnight
- v) IV Hydration with dextrose containing drip
- vi) Follow hospital's NBM protocol for Diabetic patients for further guidance

o) Calling Blood Transfusion Service (BTS) MO

- i) Blood products can often be obtained just by requesting for it from the blood bank.
- ii) However, certain products or patients will need verbal approval from the BTS MO. The number is **9186 4133 (nationwide)**.
- iii) Situations where BTS MO approval is needed
 - Platelets, FFP, Cryoprecipitate
 - Rhesus negative patients needing Rh negative blood
 - Patients with antibodies needing antibody negative blood
 - Special blood products (e.g. leukocyte reduced/leukocyte filtered/irradiated)
 - Children
 - Many blood products required (e.g. more than 2 units)
 - When it is absolutely not indicated (e.g. Hb 12 and you want to transfuse 1 pint. In this case, BTS MO may not approve unless patient is actively bleeding).

- iv) When in doubt, the blood bank staff would call the nurses who will then inform you that you need to call the BTS MO.
- v) Essential information to know before calling the BTS MO:
 - Indication for blood product transfusion;
 - Name and NRIC number of the patient;
 - Current Hb/Plt; blood group;
 - Presence of any antibodies and what antibodies; and
 - How many units of [blood product] are required.

p) Blood Products

- i) Packed red blood cells (PCT)
 - Made from a unit of whole blood by centrifugation and removal of plasma
 - Leukodepleted PCT decreases cytomegalovirus (CMV) infection rate by removing TW
 - Irradiated PCT reduces transfusion associated graft versus host disease
 - Indication: Anaemia
- ii) Fresh frozen plasma (FFP)
 - Contains all factors of the soluble coagulation system
 - Indication: Factor deficiency, coagulation disorder
- iii) Cryoprecipitate (Cryo)
 - Contains concentrated subset of FFP components, including fibrinogen, von Willebrand factor and factor XIII
 - Indication: Fibrinogen/von Willebrand factor deficiency, factor deficiency (volume-restricted patient)

- iv) Platelet (Plt)
- Single unit derived from 1 whole blood unit
 - Pooled plt derived from multiple donors from whole blood collections
 - Apheresis plt refers to multiple packs of plt derived from single donor
 - Indication: Thrombocytopenia

****Tip:** Calling the BTS MO can sometimes be daunting as they will always question the indication for blood transfusion. Have the necessary information ready before calling them to request for blood products – call blood bank if unsure of blood group and antibody status. Please understand that blood products can be low in supply, hence they will need to prioritise them for patients who are unwell and therefore, need them urgently.

q) Requesting for Urgent Radiological Investigations

- i) Know the Indication for an urgent scan (e.g. suspected perforated viscus, Cauda Equina Syndrome etc)
- ii) History, Past Medical History, **pregnancy status**
- iii) Examination Findings – e.g. Is there guarding, signs of peritonism? If for urgent MRI Spine in patient with suspected Cauda Equina Syndrome, what are the neurological deficits? How is the anal tone on DRE? Is there any Saddle Anaesthesia (please refer to Common Orthopaedic emergencies for more information!)
- iv) Prior Investigations – Previous scans?
- v) Unsure of which scan to order?
- There are multiple different types of CTs and MRIs and it can be confusing as to which is the appropriate study to order. Please double confirm with your MO/registrar prior to ordering, and if they are unsure, please call up the radiology department to enquire. Ordering a wrong study can cause further delays in patient management.

vi) Important information you will need to convey to your friendly radiologist:

- If you're requesting for a **CT study** where iodinated intravenous contrast is indicated, please check the following:
 - What is the patient's renal function? Intravenous contrast carries a risk of contrast induced nephropathy (CIN) in patients with renal impairment.
 - If the eGFR is <45 – the patient **will not** be able to receive intravenous contrast, **unless** the patient's on dialysis.
 - If the eGFR is between 45-60, you will need to counsel your patient on CIN risk, and obtain consent. Please document this process on Citrix. Proof of documentation is required before the study can be performed.
 - Does the patient have >2 drug allergies or a history of asthma? If yes, he/she will require steroid preparation prior to the study. Please double confirm the protocol for steroid preparations as different hospitals have different protocols.
- Please ensure that your patient has a working intravenous cannula prior to them going for a scan requiring intravenous contrast. Most studies will require at least a 22G IV cannula (blue plug). However, certain studies will require a larger bore IV cannula due to the need for higher flow (20G; pink plug). If you're unsure of which IV cannula is appropriate, please check with the radiology department. Sending a patient down for a scan with an inappropriate/non-functioning IV cannula will cause delays in getting the scan done.
- If you're requesting for a **MRI study**, please check the following:
 - If the eGFR is <30, the patient **will not** be able to receive intravenous contrast, **regardless of whether the patient is on dialysis.**
 - Does the patient have any implants? (e.g. pacemakers). Implants must be MRI compatible, before a MRI can be performed.
 - Recently inserted implants may or may not qualify for a study – most MRI compatible implants will only be considered safe for imaging 4-6weeks post insertion (due to risk of implant migration in the initial period).
 - If the patient requires a MRI scan prior to this period, ensure that you document that this has been discussed with the surgeon who inserted the implant, and is agreeable to proceed.

- Does your patient require sedation for the procedure?
 - o Unlike a CT study, MRI studies take a significantly longer time to perform, and will require the patient to lie still to prevent motion artefacts. For eg, a non-contrast MRI brain done for a stroke protocol takes approximately 20-30minutes. If your patient is unlikely to lie still for such a long period of time (e.g patient is restless, anxious, claustrophobic etc), please highlight this when requesting a scan. Your patient may benefit from IV sedation.
 - o Please note that not all patients can qualify for IV sedation and this will require assessment prior to booking the scan. Sedation cases are only done during the day.

****Tip:** If not sure of the indication for an urgent scan, always check with your senior i.e. MO or SR. If the wrong information is conveyed to the duty radiologist, scan may be delayed and therefore potentially life-saving treatment as well.

3. How to Survive on Call

a) **Pre-call Preparation**

- i) Make sure you know which day you are on call
- ii) Get a good night's sleep before that
- iii) Bring your phone charger
- iv) Bring a set of scrubs or wear scrubs to work, and wear comfy footwear
- v) Place your belongings in the call room/shower
- vi) If your team is nice and there is very little work to do, you may be able to end work earlier and head to your call room
- vii) Grab a good dinner and buy snacks. Always have some food with you
- viii) Prepare a sheet of paper on which you will write all your call changes. This can be divided by location, or actives vs passives
- ix) Find out who your MO and registrar are, and save their numbers on your phone. Inform them of any new patients and sick patients

b) Handovers

- i) Most hospitals have a handover system where the daytime teams will handover any urgent things that need to be done at night.
- ii) Some examples of handover items include:
 - Tracing blood/ radiological investigations
 - Reviewing patients at night
 - Following up on blue letter replies
- iii) Most departments uses SBAR format for verbal handover of patients

Handover Format	Example
<p>S (Situation):</p> <ul style="list-style-type: none"> - Identify yourself and location - Patient identification - Patient's current condition or change in condition <p>B (Background):</p> <ul style="list-style-type: none"> - Reason for admission - Significant past medical history - Current medication - Recent interventions <p>A (Assessment):</p> <ul style="list-style-type: none"> - Working diagnosis - Clinical concerns <p>R (Recommendation):</p> <ul style="list-style-type: none"> - Suggested management plans (investigation, treatment, referral etc) - Plan of action if patient's condition changes - Areas of focus for next shift 	<p>S:</p> <ul style="list-style-type: none"> - <i>I'm Dr Robert Lee from ward 78</i> - <i>I'm calling about Mr Lee TH from ward 78 bed 24</i> - <i>He has been complaining of left sided weakness for the past 2 hours and his blood pressure is elevated at 180/110mmHg. Physical examination also revealed right facial weakness and left upper and lower limb weakness</i> <p>B:</p> <ul style="list-style-type: none"> - <i>He was admitted yesterday for chest pain and headache.</i> - <i>He had a history of atrial fibrillation on aspirin daily</i> <p>A:</p> <ul style="list-style-type: none"> - <i>The working diagnosis is left-sided stroke</i> <p>R:</p> <ul style="list-style-type: none"> - <i>I am requesting for urgent cranial imaging</i> - <i>I'm referring to the Neurologist urgently</i> - <i>Start anti-hypertensive if his blood pressure worsens</i>

c) Changes on Call

- i) These changes can be divided into:
 - Actives: New cases that have just been admitted. Clerk, examine, come up with an impression, and order investigations and treatment for the patients
 - Passives: Preexisting patients to whom something has happened. Ideally, all patients should be assessed before initiating treatment
- ii) Prioritise seeing patients who are unwell e.g. New Admissions for Early Ward Review, Passives who are sick with unstable vitals
- iii) It is useful to refer to the respective departmental guidelines for more detailed management or drug dosages
- iv) When in doubt or the patient is unwell, escalate to your MO
- v) In general, whenever nurses call you to attend to patients for medical complaints, screen their status by asking for vital signs
- vi) It is important to document your findings and patient's vital signs whenever you review a patient on call. Use the CTSP (called to see patient) format

Example

Date/Time:

CTSP: Fever Tmax 39.9 degrees at 11pm

S:

Patient nil complaints of abdominal pain, headache, blurring of vision, cough, sputum, sore throat, lower leg swelling, rashes, joint pain or pain over IV plug. However, complains of new onset dysuria and urinary frequency for 1 day.

O:

Vitals: T38.5 BP 120/80 HR 95 SpO2 99% on RA

o/e:

Alert, non toxic, GCS 15, not in respiratory distress

Heart S1S2

Lungs clear, good air entry bilaterally

Abdomen soft, mild suprapubic tenderness, renal punch negative

Calves supple

No phlebitis, no rashes seen

A:

Possible UTI

P:

- 1) Collect UFEME and urine cultures
- 2) Bloods – FBC, RP, CRP, Procalcitonin, Blood cultures x 1 set (Aerobic and Anaerobic)
- 3) Start IV Ceftriaxone to cover empirically for UTI
- 4) Inform if BP < 90/60, HR > 110

[Chop & Sign]

d) Approach to Common Call Conditions

i) Fever

Possible Causes of Fever		
URTI: Runny nose, sore throat, cough, myalgia	UTI: Dysuria, suprapubic pain, renal flank pain, chills& rigors, catheterised or recent catheterisation. Check for renal punch	Pneumonia: Check SpO2, respiratory distress, cough. Listen to lungs for chest signs such as reduced air entry or crepitation
Intraabdominal: Cholecystitis, cholangitis, etc. Examine the abdomen for Murphy's sign. Post-operative patients may have infected collections or haematomas	Lines: Check the IV plug sites for phlebitis. Check any central lines for signs of infection such as tenderness, erythema, and pus discharge.	Skin: In bedbound patients, check for infected sacral sores. Look for rashes that might suggest dengue or viral causes
DVT: check the calves for any tenderness or swelling	Gouty flare or Joint infections	

- Defined as T 38.0 or above
 - a. T 37.5 – 37.9: Low Grade Fever
- Essential questions to answer:
 - First fever of the admission? Have they been admitted for more than 48 hours which means that the likelihood of a hospital-acquired infection is higher?
 - What is the current diagnosis? Are they already on antibiotics? Are the antibiotics appropriate for the blood/ urine/ swab culture results?
 - Any new symptoms?
 - Are the vitals stable? Is the patient hypotensive?
 - Did they undergo any procedures recently (e.g. post-operative, interventional procedures)?

- The general guide for post-operative patients with fever
 - Day 1: atelectasis/tissue trauma
 - Day 2-4: pneumonia, UTI
 - Day 3-5: DVT, pulmonary embolism (PE)
 - Day 5-7: wound infection
 - Any time: drug fever

- What to do?
 - Full septic work up
 - Blood: Blood cultures, FBC/CRP +/- procalcitonin
 - Urine: UFEME, urine cultures
 - Swabs: Throat swabs for viral URTI
 - Stool: GI Panel PCR, Stool c/s. If > 48 – 72 hours in hospital and/ or receiving broad spectrum antibiotics, consider Clostridium difficile PCR
 - Lines (e.g. CVC, PICC): 1 set of Blood cultures from each port and KIV Fungal Blood cultures
 - DO NOT take blood cultures from dialysis lines

- If patient is clinically unwell, consider starting antibiotics and giving IV hydration. If already on antibiotics, consider escalation.

- Generally, blood cultures should be taken as long as a patient spikes a fever UNLESS
 - Post-operative day 1 and non-infective causes are likely
 - Blood cultures have been recently taken and still pending
 - Primary team indicates no need for blood cultures because fever is likely to be due to malignant fever/ intra-abdominal abscess for which fever is down trending
 - Patient refuses – in which case document clearly that you explained to patient risks of not taking blood culture and starting antibiotics

- In well patients, you can leave the decision to start or escalate antibiotics to the primary team the next morning OR you can wait for the infective markers to return before deciding

- **Neutropenic Sepsis:** Temp 38.3, or sustained temp >38 for > 1hr with ANC <500 (or expected drop <500 in 48h)
- ****STRICTLY NO DRE**
- Start Broad Spectrum Antibiotics according to hospital's neutropenic sepsis antimicrobial guidelines e.g. IV Tazocin

ii) Abdominal Pain

Common Causes	Less Common Causes	Uncommon but Life-threatening Causes
<ul style="list-style-type: none"> - GERD or Gastritis - Constipation colic 	<ul style="list-style-type: none"> - Renal colic - UTI - Gynaecological causes - Post-op ileus - Diabetic ketoacidosis 	<ul style="list-style-type: none"> - Intestinal obstruction - Abdominal Aortic Aneurysm - General surgical conditions: acute cholecystitis, cholangitis, appendicitis, pancreatitis, Peptic ulcer - Acute coronary syndrome: epigastric pain, atypical presentations

- Approach
 - Check vitals – stable? If patient is tachycardic, it could be due to pain, sepsis or hypovolemia
 - History – has patient had this pain before? Screen for GERD/constipation
 - Examination – look for any abdominal distension, hernia, guarding or rebound
 - ECG – For patients with epigastric pain TRO ACS
- Most patients are generally well, so you can give a trial of magnesium carbonate 10ml stat or antacid or gaviscon if gastritis is suspected. Can also trial fleet, bisacodyl supp or lactulose if constipation colic is suspected.
- However, if patient appears unwell, consider investigations such as:
 - Amylase/ Lipase if suspicious of Pancreatitis, Lactate
 - Erect CXR to look for free air under the diaphragm
 - AXR – To look for dilated bowel loops, Urinary calculi, Faecal Loading
 - Update your MO to see if further investigations such as CT abdomen and pelvis are warranted

iii) Shortness of Breath/ Desaturation

Possible Causes of Shortness of Breath/Desaturation		
Pneumonia	Asthma/COPD exacerbation	Diabetic ketoacidosis
Pleural effusion	Acute coronary syndrome	Metabolic acidosis
Pulmonary edema	Allergy/Anaphylaxis	Splinting of diaphragm due to abdominal distention
Pneumothorax	Arrhythmias	
Pulmonary embolism	Anxiety	

- Approach
 - Check vitals
 - Whenever nurses tell you a patient is breathless, take it seriously. Check their SpO₂. Any fever?
 - History
 - Look through the case notes. What is the patient admitted for? Occasionally, patients may have been known to have pneumonia and their breathlessness is actually improving
 - Past medical history
 - Nature of the breathlessness
 - Associated symptoms
 - Drug history
 - Examination
 - Any increased work of breathing or tachypnoea?
 - Can they speak in full sentences?
 - Look for signs of fluid overload – elevated JVP, bibasal crepitations, peripheral oedema (look at sacrum, scrotal and lower limbs)
 - Look for possible DVT
 - Investigations
 - CXR
 - ABG – indicated when patient is desaturating
 - ECG
 - Other bloods – cardiac enzymes, electrolytes, FBC

- Management
 - o Depends on the underlying cause. Give patient oxygen to maintain saturations. Keep SpO₂ > 94%. Consider escalating to MO if patient is unwell and especially if patient requires high oxygen concentration to maintain saturations e.g. Venturi Mask 40 – 50% or Non-Rebreathable Mask (NRM).
 - o Consider HDU/ ICU transfer
 - o Pneumonia: Culture and start IV Antibiotics
 - o Pulmonary Oedema: IV Furosemide. Strict I/O charting. Insert IDC
 - o Asthma/ COPD Exacerbation: Nebulised Bronchodilators, Steroids, KIV Antibiotics if there is suggestion of infective exacerbation.

****Tip:** Do not panic! It is always easy to give into our nerves when we see patients who are acutely SOB. Ensure the patient is alert (indicating patent airway) and getting adequate oxygen to keep his/ her saturations up. Obtain the history and examine the patient. Get the necessary investigations including ABG especially if the patient has desaturated. If the patient is drowsy (i.e. unable to protect airway) or has poor saturations despite being on NRM/ requires high concentration of oxygen, escalate to your MO while waiting for investigation results.

Let the nursing staff know that the patient is sick and ask for their help to administer supplemental oxygen and to monitor them closely too.

Remember! You are not alone!

iv) Chest Pain

Important Causes of Chest Pain		
Acute coronary syndrome	Aortic dissection	Pulmonary embolism
Pneumothorax	Oesophageal rupture	Musculoskeletal/GERD

- Another complaint to take seriously.
- Once again, check vitals, history and examination. Check for radio-radial delay. Palpate chest wall for any reproducible tenderness
- Investigations
 - ECG (can ask nurses to do over the phone so that it will be ready by the time you see patient), cardiac enzymes
 - If GERD suspected, consider gastritis meds
 - If there are any new ECG changes (compare to old ECGs or old notes), consider possibility of non-ST elevated myocardial infarct and unstable angina
 - Trace the cardiac enzymes urgently
 - Consider completing 3 sets of cardiac enzymes
 - Presence of ST elevation on the ECG, refer Cardio urgently for possible percutaneous coronary intervention
 - KIV Load Aspirin/ Clopidogrel or Ticagrelor

****Tip:** Not sure if the patient has significant ECG changes to suggest myocardial ischemia? Fret not! All of us have been through this before and interpreting ECGs can sometimes be difficult when you first start out. If in doubt, please ask your MO. We have all sent ECGs to our seniors over Tiger-Text to get an opinion! You are not the only one and do not be afraid to ask!

v) Acute Retention of Urine

Common Causes	Less Common Cause
<ul style="list-style-type: none"> - Immobility - Constipation - Infection - Recent surgery (general anaesthesia) - BPH/chronic urinary retention 	<ul style="list-style-type: none"> - Cauda equina – ask for back pain

- Common complaints
 - Patient NPU for >12 hrs
 - Patient complain of unable to pass urine and has suprapubic discomfort
- Physical examination
 - Palpable or percussible bladder?
 - Suprapubic tenderness or renal punch?
 - +/- DRE for enlarged prostate/saddle anaesthesia
 - If patient has back pain → lower limb neuro examination
- Bladder scan (ask nurses to do before you go see patient) – Insert IDC if > 250 to 400mls, OR if patient in great discomfort
- Occasionally, patients refuse IDC insertion. Explain to patient risk of infection, sepsis, renal impairment, bladder rupture, etc.
- Document down that patient understands and accepts these risks
- Conservative management: clear patient's bowels
 - Some people try PO Citravescent but there is no evidence that this helps
- Consider obtaining urine for UFEME and culture

****Caution No. 1:** You will notice that some of your colleagues have tried Potassium Citrate mixture to relieve ARU (though there is no evidence). Please exercise caution in patients with Chronic Kidney Disease. Patients with CKD have been discharged accidentally with Pot Citrate and subsequently re-admitted with Hyperkalemia – some patients have been re-admitted with K > 7 – which is lethal! Discontinue this if not required!

vi) Hypotension

Common Causes of Hypotension		
Sepsis	Acute coronary syndrome	Heart failure
Hypovolemia	Hemorrhage	Anaphylaxis
Low baseline blood pressure in some young females	Pulmonary embolism	Arrhythmias

- Look through the vitals chart to see the BP trend.
 - If there is a sudden drop in BP associated with tachycardia, treat it seriously
- Review the input/output chart to see what patient has been receiving over the past few days
- Check the stool chart for possible PR bleeding or melena
- Look through case notes to see what patient is admitted for
- Important to look at past medical history as well to identify patients who may need fluid restriction (e.g. CKD/heart failure/liver disease)
- Examine the patient
 - Look for evidence of fluid overload/ pulmonary oedema
 - Dehydration
 - Source of sepsis (may already be identified)
 - Abdominal tenderness due to hemorrhage from peptic ulcer disease or AAA
 - Per rectal examination if gastrointestinal bleeding can't be excluded
- Management
 - Run a fluid bolus fast to see if BP improves e.g. 250-500ml normal saline over 30 min, with Q15min Blood pressure and heart rate measurements until blood pressure is stable
 - Strict input/output charting
 - Consider FBC, blood cultures, cardiac enzymes, electrolytes, ABG, ECG and Lactate
 - Consider escalating antibiotics (ask MO)

vii) Hyperkalaemia

- Commonly found in renal impaired patients
- Check that the K is truly elevated – is the sample haemolysed? Was it taken from a drip arm? If patient is completely well with no risk factors for hyperkalaemia and ECG is normal, consider asking for a repeat K
- If K is truly high:
 - Check patient to see if they have a pulse! They may be in pulseless electrical activity
 - ECG: Look for tall tented T waves, flattened P waves, prolonged QRS etc
 - Look through their medications list and suspend any that can cause hyperkalaemia
- Indication for insulin-dextrose:
 - ECG changes – Give IV Calcium Gluconate!
 - K 6 or more
- Steps of administration
 - Ensure that patient has a patent IV plug. Try a larger bore plug if possible as dextrose is highly caustic to veins. Flush with normal saline first to ensure that plug is patent. If not patent, you may need to insert a new plug
 - Put on gloves (50% dextrose is extremely sticky)
 - Draw out 40 mls of D50 in 2 20mls syringes
 - **Using an insulin syringe**, withdraw 10 units (or less) of Actrapid
 - Transfer the insulin to the syringes of D50
 - Push in the 2 syringes of D50, slowly
 - Flush with normal saline
 - Check hypocount stat 1-2 hrs later
 - Can consider repeating K in 4 hrs

****Caution:** Actrapid has been drawn up using normal syringes which is incorrect! As such, wrong doses of Insulin have been administered before. Familiarize yourself with an insulin syringe before your first call and double-check before administering the medication.

If you realise that wrong dose of Actrapid was given, immediately escalate to your senior so that the patient may be transferred to HDU/ ICU for closer monitoring.

viii) GCS Drop/ Drowsiness

Common Causes	Less Common Causes
<ul style="list-style-type: none"> - Hypoglycemia* - Stroke - Intracranial Haemorrhage 	<ul style="list-style-type: none"> - Metabolic causes e.g. Thyroid Dysfunction, Hepatic, Uraemia - Electrolyte disturbances e.g. Hypo-/Hypernatremia - Sepsis - CO2 Narcosis - Post-seizure confusion/ drowsiness - Non-convulsive Status Epilepticus

- Approach
 - Check vitals
 - **STAT** Capillary Blood Glucose (Hypocount)

- History
 - Look through the case notes. What is the patient admitted for? What is the baseline mental status? How has the patient been during this admission – Conversant vs drowsy?
 - Past medical history
 - Drug history – Any new psychotropic drugs or analgesia e.g. Opioids? Any history of illicit drug use

- Examination
 - Is the patient responsive? Able to follow commands?
 - Any suggestion of airway compromise
 - Pupils: Dilated or Pinpoint. Reactive?
 - GCS scoring – e.g. E3V2M4-5
 - Able to move all 4 limbs?
 - Plantars – Downgoing or Extensor?

- Investigations
 - Bloods – FBC, Renal Panel, Electrolytes, Liver Function Tests (KIV Ammonia levels if known cirrhotic and/ or previous episodes of hepatic encephalopathy), PT/ APTT, Thyroid Function (if not done recently), Inflammatory Markers if there is suspicion of Sepsis
 - CT Brain

- Management
 - Correct Hypoglycemia! – IV Dextrose 50% 40 ml STAT (If patient has poor GCS, they will not be able to safely take a glucose drink (may aspirate))
 - Escalate to MO if Glucose normal and patient has acute GCS drop – KIV CT Brain STAT

****Tip 1:** Ensure that a Capillary Blood Glucose is checked! One of the most common causes of GCS drop is due to hypoglycemia – which is easily correctable! You should see a drastic improvement in patient’s mentation – hold off the patient’s Oral Diabetic Medications and Insulin thereafter!

****Tip 2:** If the cause of patient’s acute GCS drop is likely to be due to an ischemic stroke, patient may be a candidate for Systemic Thrombolysis +/- Endovascular Thrombectomy if within eligible window. Hence, act fast and escalate to your senior once the basic investigations and management are done. Also, consult your senior before getting an urgent CT Brain

ix) Haematemesis

Common Causes	Less Common Causes
<ul style="list-style-type: none"> - Bleeding Gastric/ Duodenal Ulcer - Oesophageal Varices (in patients who are known cirrhotics) 	<ul style="list-style-type: none"> - Angiodysplasia - GI Malignancy - Aorto-enteric Fistula (in patients with AAA) - Mallory-Weiss Tear - Dieulafoy's Lesion

- Approach
 - Check vitals immediately
 - Attend to patient

- History
 - What is the nature of bleeding? Fresh red blood or coffee ground vomitus?
 - Any melaena, PR bleeding?
 - Any abdominal pain?
 - Past medical history
 - Any history of peptic ulcer disease, cirrhosis?
 - Any previous endoscopy done?
 - Drug history – Any antiplatelets, anticoagulation e.g. Warfarin, NOACs

- Examination
 - GCS. Alert? Obtunded?
 - Peripheries – Cool or well perfused? Pulse?
 - Any Hypotension?
 - Abdomen – Soft? Any signs of Peritonism?
 - DRE: Any melaena?

- Investigations
 - Bloods – FBC, Renal Panel, Electrolytes, Liver Function Tests, Lactate, PT/ APTT, GXM

- Management
 - Ensure airway patent
 - Give supplemental oxygen
 - Set 2 large bore plugs (At least one green plug)
 - Stabilise Haemodynamics

- Fluid Resuscitation with Crystalloids e.g. Normal Saline, Hartmann's, Plasmalyte (if available)
- Arrange for Blood Transfusion to keep Hb > 7

- Correct Coagulopathy
 - e.g. Platelet transfusion, FFP
 - If patient is on anticoagulation – KIV speak to Haematology for use of Reversal Agents like prothrombin complex concentrate

- IV Proton Pump Inhibitor infusion e.g. Esomeprazole
 - KIV IV Somatostatin in suspected variceal bleeding (discuss with MO)
 - If cirrhotic, to start prophylactic IV Ceftriaxone

- Escalate to MO on call!
- Refer Gastro/ General Surgery urgently KIV for OGD
- If large volume and persistent GI bleeding, may need to activate Massive Transfusion Protocol
- KIV Transfer to HDU/ ICU for closer monitoring

x) Hypertension

- Approach
 - If SBP > 180, DBP > 100, there is a need to rule out end organ damage (indicating HTN Emergency)
 - If no end organ damage → HTN Urgency
 - End Organ Damage:
 - Neuro: Infarct/ bleed/ encephalopathy/ papilloedema
 - CVS: AMI/ Acute Pulmonary Oedema/ Aortic dissection
 - Renal: AKI

- History
 - Any Chest Pain, SOB?
 - Any Headache, Nausea/ Vomiting, Blurring of Vision, Weakness/ Numbness?
 - Past medical history
 - Drug history

- Examination
 - GCS
 - Neurological Exam
 - JVP, Auscultate Lung Bases for Crepitations
 - Peripheral Pulses
 - Fundoscopy to look for Papilloedema

- Investigations
 - If suspicion of HTN Emergency – send off FBC, Renal Panel, Electrolytes, PT/ APTT, Cardiac Enzymes
 - ECG
 - CXR
 - CT Brain urgent

- Management
 - HTN Urgency: Serve anti-HTN meds early. If already served, KIV low dose Calcium Channel Blocker e.g. Amlodipine 2.5 – 5 mg once
 - Alternative: Captopril (To check renal function before giving)

 - HTN Emergency: Inform MO urgently! Will need hourly Vitals, GCS charting and KIV transfer to HDU/ ICU

****Tip:** It will be quite difficult to review every patient with high BP on call! Some helpful things that you can ask for before deciding to review are the patient's vitals and GCS. If patient is comfortable, you may be able to give low dose anti-HTN medications and ask for a recheck BP in 1-2 hours time. However, if patient sounds unwell e.g. Confused/ Poor GCS/ Symptoms of Chest Pain, SOB, please see the patient as quickly as possible to ensure that HTN emergency is not missed!

xi) Hyperglycemia

- Approach
 - Usually called when CBG > 20 mmol/ L
 - Ask for: Vitals, Mental Status (GCS)
 - Usually due to poorly controlled DM

 - If well, avoid prescribing additional insulin or OHGAs after dinner time as may get nocturnal hypoglycemia

 - If CBG >20, can review CBG trend non-urgent KIV give small dose Actrapid ~ 4 units or give according to Sliding Scale (check CBG 4hrs later e.g. 2am)

 - If patient has signs of drowsiness or acidosis (e.g. Obtunded, Kussmaul Breathing), be on the alert for Hyperglycemic Crises!

- DKA
 - Glucose > 14 mmol/ L
 - Urine Ketones positive OR serum Ketones > 2.0 mmol/ L
 - Bicarb < 15 mmol/ L; pH (on ABG or VBG) < 7.3

- HHS
 - Glucose > 30 mmol/ L
 - Serum Osmolality (Calculated) > 320
 - No acidosis
 - Estimated Serum Osmolality = $2 \text{ Na} + \text{Urea} + \text{Glucose}$

- Causes
 - Infection/ Sepsis, inappropriate OHGAs/insulin, non-compliance, ACS, pancreatitis, drugs e.g. corticosteroids

- Investigations
 - Bloods if suspicion of Hyperglycemic Crisis – FBC, RP, Electrolytes, VBG/ ABG, Ketones, Osmolality
 - KIV UFEME, Urine culture, Blood cultures
 - ECG
 - CXR

- Management
 - Hyperglycemic Crises: Basic Principles are Fluid Resuscitation/ Replacement, IV Insulin administration, Correction of underlying cause e.g. Infection
 - If unstable e.g. poor GCS, unstable haemodynamics, then will require HDU transfer for closer monitoring

****Tip:** If patients just have hyperglycemia secondary to poorly controlled DM or missed medications, you can give a small dose of Actrapid overnight to achieve euglycemia. You can follow the sliding scale which most hospitals have if in doubt.

Every Hospital should have a DKA/ HHS protocol that you can follow as well to save you the stress of browsing furiously through UptoDate! If in doubt, can always consult your MO as well!

xii) Ordering of Medication

- Please screen through the medication list to ensure no drug interactions/allergies

Common Medications to Order on Call		
Sleeping Pill	<ul style="list-style-type: none"> • Piriton 4mg once 	<ul style="list-style-type: none"> • Be wary of elderly patients who may easily be tipped into delirium.
Cough Mixture	<ul style="list-style-type: none"> • Dextrometorphan 10ml TDS • Procodin 10ml TDS 	<ul style="list-style-type: none"> • Do check that the coughing patient is not having an asthmatic attack
Panadol	<ul style="list-style-type: none"> • Paracetamol 1g QDS PRN (lower dose if patient has transaminitis, none if patient has liver cirrhosis) 	<ul style="list-style-type: none"> • What is the indication: pain/ fever/ headache/ chest pain? • If the patient has fever, chest pain or other worrying symptoms for which they ask for pain relief, it is important to review the patient.
Laxatives	<ul style="list-style-type: none"> • Lactulose 10ml TDS • Dulcolax PO 10mg once • Dulcolax suppository 10mg once 	<ul style="list-style-type: none"> • Only God knows why laxatives suddenly need to be ordered at night, but just do it
Gastric meds	<ul style="list-style-type: none"> • Magnesium carbonate 10ml TDS • Antacid 1 tab TDS 	<ul style="list-style-type: none"> • May cause diarrhoea

e) Common orthopaedic emergencies

i) Open fractures

- An open fracture is a fracture that communicates with the external environment.
- **Gustilo & Anderson Classification**
 - Grade I: Wound <1 cm with minimal soft tissue injury
 - Grade II: Wound > 1cm without extensive soft tissue injury
 - Grade III
 - IIIA: Wound 1cm, severe bony comminution from high energy trauma
 - IIIB: Extensive soft tissue loss with periosteal stripping requiring soft tissue coverage
 - IIIC: Arterial injury requiring vascular repair
- Initial Management:
 - ATLS principles
 - Antibiotics: IV Cefazolin (Add on Gentamicin ± Metronidazole if gross contamination or soilage)
 - Anti-tetanus toxoid
 - Analgesia
 - Irrigation of wound, removing gross contaminants
 - Dressing wound,
 - Reduction of fracture, application of splint for temporary stabilization
 - Keep patient NBM, PFO bloods
- Definitive Treatment:
 - Early wound debridement and surgical stabilization. External fixation with a negative pressure dressing of the soft tissue defect is utilized in most cases
 - Refer to BAPRAS guidelines for more details.

ii) Compartment Syndrome

- Compartment syndrome is a condition where an osseofascial compartment pressure rises to a level that decreases perfusion. This can lead to muscle ischemia and necrosis.

- Presentation
 - Severe pain out of proportion
 - Paraesthesia
 - Other signs such as pallor, pulselessness, paralysis are *late* signs
- Etiology

Extrinsic Compression	Intrinsic
Constrictive dressing	Fractures (Commonly tibial, forearm fractures)
Tight splints or casts	Crush injuries
Burns	Haematomas
	Reperfusion injury

- Investigation
 - **Compartment syndrome is a clinical diagnosis**
 - Needle manometry is an adjunct used to measure compartment pressure when assessment is difficult (e.g. obtunded patients, paediatric patients)
 - Absolute compartment pressure of >30mmHg is diagnostic
 - Creatinine kinase levels
- Management
 - Loosen all constrictive dressing
 - Emergent fasciotomy, temporizing stabilization of fractures if any (external fixators).
 - Haematogenous
 - Direct inoculation
 - Contiguous spread

iii) Septic arthritis

- Septic arthritis refers to inflammation of a joint caused by bacterial infection. The most common sites of infection are the knee (>50%), followed by the hip, elbow and shoulder. Differentials include crystal arthropathies such as gout or pseudo-gout. Septic arthritis is an orthopaedic emergency as it causes irreversible cartilage destruction in the involved joint.
- Etiologies of bacterial seeding
 - Haematogenous
 - Direct inoculation
 - Contiguous spread

- Common Offending Organisms
 - Staphylococcus (MSSA, MRSA, Epidermidis)
 - Streptococcus (Strep pyogenes, Strep Agalactiae)
 - Neisseria Gonorrhoea
- Presentation
 - Acutely painful joint with effusion
 - Joint erythema and warmth
 - Inability to weight bear
 - Limited range of motion even on passive ranging
- Investigations
 - Bloods:
 - FBC, ESR, CRP
 - Blood cultures
 - X-Ray of the affected joint
 - Joint aspiration (Gold standard for diagnosis), to perform before initiation of antibiotics
 - Gram stain
 - Fluid cultures (aerobic and anaerobic)
 - FEME (**WBC cell count of >50K is diagnostic**)
 - AFB and fungal smear and culture
- Treatment
 - Urgent Arthrotomy and washout
 - Empiric antibiotics (IV Cefazolin / Vancomycin), followed by culture guided

iv) Necrotising Fasciitis

- Necrotizing fasciitis is a rapidly progressive severe soft tissue infection of the superficial fascia with thrombosis of the cutaneous microcirculation but relative sparing of underlying muscle. It is an orthopaedic emergency as it can be potentially limb and life threatening.
- The diagnosis of necrotizing fasciitis is made clinically. Serial examinations will aid in the diagnosis
- History
 - Predisposing trauma or injury
 - Exposure to marine organisms / seawater
 - Risk factors: elderly, immunocompromised host eg poorly controlled DM

- Examination
 - Speed of progression
 - Tenderness extending beyond apparent area of skin involvement
 - Warmth and swelling of limb
 - Rapidly progressing cutaneous manifestations (erythema, blistering)
 - Dusky skin discolouration with haemorrhagic bullae in late stage
 - Crepitus
 - Patient with necrotizing fasciitis will look toxic
 - Close monitoring of vital signs is imperative
 - Serial examination to look for rapid spread of erythema or skin signs

- Investigations
 - X-Ray of affected limb - looking for soft tissue gas
 - MRI, fluid along fascial planes
 - Biochemical markers for LRINEC score.
 - CRP, WBC, Hb, Na, Cr, Glucose
 - 8 points signify high risk of NF
 - Blood culture

- Treatment
 - Close monitoring with hourly vitals. Consider High dependency monitoring
 - Keep NBM and PFO
 - Antibiotics: IV Penicillins, IV Ceftazidime, IV Clindamycin (or based on the Abx guidelines of your institution)
 - Urgent aggressive debridement KIV amputation

v) Cauda Equina Syndrome

- Cauda equina syndrome (CES) is a constellation of symptoms that result from compression of the terminal spinal nerve roots at the lumbosacral spine.

- It is imperative to know the signs and symptoms well in order to come to diagnosis. As a HO, you must have a clear and detailed documentation due to potential medico-legal issue

- Etiology
 - Large disc herniation
 - Severe spinal stenosis
 - Tumours - most commonly metastatic
 - Trauma
 - Epidural abscess

- Symptoms
 - Bilateral lower limb pain
 - Sensorimotor loss in the lower limbs
 - Bowel and Bladder dysfunction
 - Saddle anaesthesia
 - Severe low back pain

- Examination
 - Tenderness might be elicited over lumbar region
 - Assess lower limb power and sensation (from L2 to S1, based on ASIA score).
 - Assess lower limb reflexes. (Expect hyporeflexia / areflexia)
 - Perform a DRE, checking for perianal sensation (saddle anaesthesia), and anal sphincter tone integrity.

- Investigations
 - PFO bloods, inflammatory markers (ie ESR, CRP if infective etiology such as epidural abscess is suspected)
 - XR L/S spine (AP + Lat): useful for assessing for any destructive changes, disc-space narrowing or spondylolysis
 - MRI L/S spine
 - Escalate to MO / Reg
 - Keep NBM, PFO bloods
 - Spinal nursing
 - PVRU, keep in view IDC insertion
 - Urgent MRI
 - Can consider IV Dexamethasone (check with Spine consultant)

- Treatment
 - Escalate to MO / Reg
 - Keep NBM, PFO bloods
 - Spinal nursing
 - PVRU, keep in view IDC insertion
 - Urgent MRI
 - Can consider IV Dexamethasone (check with Spine consultant)

- Definitive Management
 - Surgical decompression within 48 hours (Laminectomy, Discectomy).

f) Common O&G emergencies (below adopted from KKH O&G HO guidebook)

i) Post partum haemorrhage (PPH)

- CTSP for PV bleeding in a postpartum patient.
- Definition
 - Primary PPH: PVB>500mls within 24 hours of delivery
 - Secondary PPH: PVB>500mls more than 24 hours but less than 6 weeks after delivery
- Causes: “4Ts”
 - Tone: uterine atony – most common cause
 - Trauma: tears in the vagina, cervix, vulva
 - Tissue: retained placenta tissue
 - Thrombin: DIVC/HELLP/Coagulation disorder
- Approach
 - Attend to patient immediately
 - Check vitals
 - Airway: ensure patent airway
 - Breathing: supplemental oxygen
 - Circulation: 2 large bore IV cannula, send bloods for FBC, U/E/Cr, PT/PTT, fibrinogen, ensure valid GXM, IV fluids
 - KIV blood transfusion
- History
 - Timing and mode of delivery (NVD, assisted instrumented delivery, LSCS)
 - Complications during delivery (e.g. 3rd/4th degree lacerations)
 - Placenta delivery and inspection post-delivery (placenta and membranes complete? Any manual removal of placenta required?)
 - Size of baby (risk of atony for big baby)
 - Estimated blood loss during delivery
 - Baseline Hb level
- Examination
 - GCS, signs of pallor/shock
 - Uterine tone
 - Perineum
 - Speculum to check for cervical or vaginal lacerations
 - Inspect placenta and membranes for completeness
 - Estimate blood loss

- Immediate management by HO
 - Activate help immediately! (Call MO/Registrar, senior midwife/nurses, anaesthetist)
 - Monitor BP, pulse rate, respiratory rate
 - Insert IDC
 - Obtain PPH kit – get uterotonic agents ready (IV syntocinon infusion, IV duratocin, IM carboprost, PR misoprostol)
 - Prepare for replacement of blood products KIV activate MTP for massive blood loss
 - Prepare for transfer to OT if indicated (e.g. examination under anaesthesia (EUA), repair of laceration, manual removal of retained tissues)

ii) Pre-eclampsia

- CTSP for raised BP in pregnant/post natal patient
- Important points to note:
 - Pre-eclampsia can develop **postnatally**
 - Severe pre-eclampsia can lead to significant end-organ dysfunction, such as pulmonary oedema, progressive renal insufficiency, transaminitis
 - Signs and symptoms of impending eclampsia: headache, blurring of vision/ visual disturbance, epigastric pain, hyperreflexia, clonus
 - **Eclampsia: onset of seizure in a women with severe pre-eclampsia**
- General Approach
 - Inform MO/Registrar STAT
 - Arrange transfer to delivery suit (for pregnant patient)
 - Stabilise patient: ABCs, insert IV plug, and IDC
 - History
 - Symptoms of impending eclampsia
 - PMHx for pre-existing hypertension/pregnancy induced hypertension/pre-eclampsia
 - Existing hypertensive medications (if any)
 - Physical examination
 - Papilloedema
 - Reflexes (presence of hyperreflexia)
 - Presence of clonus (presence of 3 or more beats)
 - Investigations
 - PE blood: FBC, U/E/Cr, LFT, PT/APTT, uric acid
 - Urine dipstick to look for: albmin, urine PCR, 24hour UTP
 - Monitoring
 - PE chart and strict I/O
 - Ensure urine output >30ml/hr

- Fluid regimen
 - o Judicious fluid to prevent pulmonary oedema – ensure clinically lungs are clear
 - o Fluid restrict 80mls/hour
- Antihypertensive regimen
 - o PO/IV depends on severity
 - o IV labetalol/ IV hydralazine (check protocol book for dosages and preparation)
 - o PO Labetalol (avoid if asthmatic)
 - o PO Nifedipine (avoid if likely to start MgSO4. Interacts with MgSO4 and cause muscular paralysis – neuromuscular blockade)
 - o PO Methyl dopa – longer time of action/decreased foetal variability/ need to stop postnatal as increase risk of postnatal depression
- Anticonvulsant regimen
 - o IV MgSO4 if s/s of impending eclampsia (check baseline renal function)
 - o KIV IV Diazepam if seizure not aborted with MgSO4 or MgSO4 is contraindicated
- +/- inform Anaesthetist
- +/- inform Neonatologist (especially if preterm)

- **Eclampsia**

- CODE BLUE
- Resuscitate patient – ABCs/IV access
- Stop seizures (IV MgSO4)
- For crash LSCS after stabilising patient

g) Procedure Tips

i) Venopuncture

- In most institutions, nurses help to take most of the bloods. They will escalate to you when they have failed to take the blood.
- Doctors are required to take blood cultures and GXMs
- Order of blood collection: red/yellow tubes (empty/plain tubes) → blue (citrate tube) → purple/pink (EDTA containing tube) → grey, green (others)

- Approaches to handle the difficult venipuncture
 - Use a glove: Tourniquets may not be as tight. Although painful, a rubber glove does compress veins well
 - Palpate the vein: Not all veins are visible. Feel in areas where veins generally run – the radial surface of the forearm, the antecubital fossa etc.
 - Place the vein in a dependent position
 - Tap the vein
 - Warm the vein
 - In oedematous limbs, press until the edema is cleared, or elevate the limb
 - Vary your equipment
 - Needle with syringe: Various needle and syringe sizes. Smallest needle is the blue 22g needle. After collecting the blood, you can directly transfer the blood into the blood tubes (beware needlestick injury). Switching from a 22g to a green 18g needle can be helpful to reduce haemolysis when taking renal panel, liver panel or other electrolytes.
 - Butterfly needle with syringe or vacutainer: Butterfly needles come in 18g (green) and 22g (blue) sizes. The 22g needle may be hidden by nurses, so you can ask them for a few if you're unable to find them. The tubing can be connected to either a large syringe or a vacutainer (blue cap) to which blood tubes can be directly attached, hence ensuring that you do not take too little or too much blood
 - Needle alone: When desperate, resort to the Paeds collection method of blood by puncturing the vein with needle alone and letting blood drip out into uncapped blood tubes. Remember to swirl EDTA tubes to ensure blood doesn't clot
 - IV plug with syringe or vacutainer: Connect vacutainer directly to IV plug. Vacutainers tend to have rather high pressures and can collapse small veins, making drawing blood impossible even though you know you are in the vein. They also tend to lyse blood, hence messing up your renal panel. Try using syringe instead to slowly pull blood from a tiny vein
 - Arterial puncture – when all else fails, or when you are in a great hurry

ii) Arterial Blood Gas

- In most institutions, nurses help to take most of the bloods. They will escalate to you when they have failed to take the blood.

- Indications
 - Desaturating patient – COPD, asthma, pneumonia
 - Patient with metabolic acidosis (e.g. DKA)
 - Pancreatitis as part of Ranson's score

- Prepare all materials beforehand
 - ABG syringe: Remove stopper, move plunger several times to mix the heparin within tube
 - Ice: Prepare plenty of it within a specimen bag
 - Another specimen bag
 - Needles and syringes, alcohol wipes
 - Gauze for compression

- Ensure that the patient is positioned optimally such that you are able to feel the pulsation well.

- Radial: If large quantities of blood are needed, use a butterfly and vacutainer/syringe.
 - Extend the wrist: Stabilise wrist on pillow, side of bed or kidney dish – it helps to make artery more superficial
 - Feel the pulse. Localise pulse to one point.
 - Insert needle at 45 degree angle. Tends to be superficial, hence try not to go too deep. Once flashback is seen, do not advance needle further. You should be able to see the pulsation of the arterial blood.

- Femoral: Large artery
 - Located at the mid-inguinal point. May be hidden by fat folds, ask staff nurse to help to retract fat. Ensure patient lying flat. You may have to do this yourself if no one is free
 - Use a green needle and a large syringe (10 or 20 mls) and insert needle at 90 degrees to skin.
 - Once you see flashback, use your other hand to withdraw the plunger. Release the fat folds, generally needle will stay within the artery as long as you don't move the hand holding the syringe
 - Avoid in patients with peripheral arterial disease

- Brachial
 - Use a butterfly needle
 - Dangerous! It is an end artery, risk of thrombosis and acute limb ischemia so use as last resort only

- Remember, compress for at least 5min to avoid pseudoaneurysms or haematoma!

iii) Blood Culture

- Indication
 - Suspicion of sepsis: fever, hypotension, altered mental state etc.

- Preparation
 - Blood culture kit
 - Blood culture bottles – consider if need fungal (e.g. immunocompromised patients, patients with lines)
 - Cleaning solution and swabs – may be inside the blood culture set
 - Syringes and needles, or IV plug
 - Sterile gloves

- Steps
 - After assessing patient, explain to patient you will need to take blood for investigation
 - Tourniquet and identify a good vein
 - Prepare your set, uncap blood culture bottles and clean the tops, and open all your items into dressing set
 - Wear sterile gloves
 - Clean and drape
 - Draw blood in sterile fashion
 - Fill blood culture bottles FIRST before filling other blood tubes

iv) Indwelling urinary catheter

- Indication
 - Strict input/output charting
 - Retention of urine – generally, if patient is in discomfort and unable to PU; OR more than 250mls - 400mls on bladder scan (threshold varies)
 - Obtaining urine for tests

- Female nurses generally help to catheterise female patients, hence most doctors will be doing male IDCs.

- Prepare set beforehand

IDC bag	IDC insertion set	<ul style="list-style-type: none"> • IDC: Foley's catheter ranges from 12Fr to 18Fr. • Larger sizes for patients with BPH. Smaller sizes for younger patients and patients who may have urethral strictures.
Lignocaine syringe gel	Sterile gloves	
20ml syringe	Non sterile gloves	
20ml of sterile water (no other fluid should be used to fill up IDC balloon)	Tape	

- Steps
 - Explain to patient what you are going to do
 - Expose patient with non-sterile gloves
 - Prepare your equipment: open up the dressing set, open all your items into the set in a sterile fashion, draw up 10mls of water and test the IDC balloon.
 - Expose area
 - Retract foreskin and ensure urethra is visible
 - Clean urethra and penis till the base
 - Drape the area
 - Apply lignocaine gel onto the urethra. Squirt the whole tube into the urethra
 - Insert the IDC all the way to the base of the catheter, awaiting clear urine. If encounter resistance, do NOT force your way through else you may create a false passage
 - Press on suprapubic region or use lignocaine syringe to draw out urine
 - Once urine is obtained, inflate balloon with 10mls of water and attach catheter to urine bag
 - Clean up, secure IDC with minimal tension with the tape
- Remember to document! Patient cleaned and draped. ___ Fr IDC inserted under aseptic technique. 10mls water inflated, clear urine drained. Patient tolerated procedure well.

****Tips:** IDCs may be difficult to insert especially for patients with pre-existing urological conditions e.g. BPH. If there is difficulty inserting after 2 attempts, escalate to your MO on call! There have been cases where multiple attempts resulted in traumatic gross haematuria with clot retention and worse, false passages requiring Urological Intervention!

v) Removing Drains

- Prepare your set

Sterile gloves	Dressing set	Steristrips or dressing
Blade	Tegaderm	Chlorhexidine wash

- Steps
 - Explain to patient what you are about to do, that it may be slightly painful but quick if they are cooperative
 - Clamp drain and release the pressure usually by opening up one of the openings
 - Open up your items into the dressing set, with sterile technique
 - Expose patient
 - Put on sterile gloves, wash hands before
 - Clean the exit site as well as drain tubing with sterile wash
 - Locate the anchoring stitch and cut using blade
 - Remove the anchoring stitch
 - Press down on the exit site by using a gauze, and remove the drain in one smooth motion
 - Use steristrips to close the exit site
 - If large or gaping, may need to place a stitch. In this case, you may need to use subcutaneous lignocaine. Ask MO or fellow HOs for guidance.
 - Cover steristrips with gauze or tegaderm

5) COVID-19

COVID-19 is an infection caused by SARS-CoV-2, a novel respiratory pathogen from the coronavirus family. The first imported case of COVID-19 in Singapore was diagnosed on January 23, 2020, followed soon after by the first case of local transmission; both cases were diagnosed and managed at our institution. Since then an increasing number of containment and control measures have been rolled out in response to the evolving situation in Singapore and as we learn more about the disease

As new House Officers, it is understandably daunting to start your careers with a global pandemic evolving before your eyes. Hence, we have introduced a section on the COVID-19 infection to prepare you for ward work in this current climate.

1. Staff Safety

A hospital's most valuable resource is its staff. It is critical that staff take appropriate measures to safeguard their own health and the health of their colleagues during the ongoing COVID-19 pandemic

a) Personal Protective Equipment (PPE)

- Guidelines on the appropriate usage of PPE in the context of COVID-19 in our institution are updated and disseminated by the Department of Infection Prevention and Control (IPE).
- In general, a risk-stratified approach is adopted with regards to the usage of PPE based on setting, personnel and type of activity performed.
- All staff should practice Standard Precautions (including hand hygiene with alcohol-based hand rub and 7 steps) in all situations.
- Staff must wear surgical masks at all times.
- If staff are required to perform aerosol generating procedures (AGPs) in any clinical context (eg. intubation, suctioning), then full PPE should be used (N95 mask + eye protection + gown + gloves).
- The appropriate PPE according to the PPE guidelines should be used in the individual's area of work: please refer to the guidelines if unsure.
- All staff should ensure that they have been mask-fitted for N95 masks. If you have not been mask-fitted, please inform your supervisor.
- If eye protection (goggles) is required as part of your PPE, and you do not have a pair, please enquire with your ward sister/supervisor where you can obtain one.
- Some institutions will require all staff to change into scrubs prior to entering restricted wards. Please check your respective institution guidelines.

b) Reporting sick

- As COVID-19 can present with relatively mild symptoms indistinguishable from other common viral causes of respiratory infection, staff who develop acute respiratory symptoms should seek medical attention immediately, instead of coming to work.
- Staff with acute respiratory symptoms (e.g. fever, cough, sore throat, runny nose) are to seek treatment from designated clinics (Either respective institution's Staff Clinic or Polyclinics during working hours, or at the ED of your respective institutions after working hours).
- This is to allow for detailed history taking and facilitation of contact tracing, should the need arise.
- Staff whose fever and / or respiratory symptoms still persist after completion of medical leave should report sick at their respective institution's Staff Clinic, or Emergency Department (outside of Staff Clinic's operating hours). **Please do not return to work.**
- For staff who are well, please comply with regular self-reported temperature monitoring during this period. Temperature taking and submission of results is compulsory twice daily.

c) Social distancing

- Measures have been put in place at the different social spots within the campus to ensure safe distancing e.g. food and retail outlets, staff rest areas and staff clinic.
- Staff are to observe the markings to keep a safe distance from one another.
- Safe distancing should be adhered at external social settings outside the workplace as well.
- These measures are put in place as there is a certain degree of risk of acquiring COVID-19 for all staff, during ongoing periods of community transmission. Complying to social distancing measures mitigates the potential of a cluster of COVID-19 infection developing amongst staff.

d) Peer support

- We recognize that these are challenging times for all healthcare workers working at the frontlines.
- Should any staff require peer support, please do not hesitate to contact your respective institution's Peer Support Hotline.

2. Areas designated for COVID-19 management during ongoing COVID-19 outbreak

Different institutions have different ward allocation to help handle the workload during the Covid-19 outbreak. As a general rule of thumb, most/if not all institutions will have isolation wards. Please ensure that you familiarize yourself with the different types of wards involved in suspected cases/patients with respiratory symptoms in your respective institutions.

- The general principle is that cases at higher risk of COVID-19 should be managed in designated areas, where the appropriate PPE can be utilized and testing to rule out COVID-19 can be performed.
- In general, patients fulfilling our local Ministry of Health's (MOH) suspect case definition for COVID-19 should be admitted to the isolation ward.
- As case definitions will continue to evolve, please continue to keep yourself updated regarding the MOH's suspect case definition for COVID-19.
- Please familiarize yourself with the prevailing protocols, PPE guidelines and workflows if you are working in a designated ward for COVID-19 management- this can be found on the hospital intranet.
- In some cases, the suspicion of COVID-19 may only arise after the patient has already been admitted (eg. through additional history-taking that reveals an additional epidemiological link).

If in doubt,

- Check the latest MOH criteria
- Stay updated with your respective institution's internal screen criteria.
- Discuss with COVID-19 on-call if the patient should be moved to a designated ward for COVID-19 management, if there are suspicious features.
- Patients who require COVID-19 swabs may require pre-approval by dedicated personnel. For example, in SGH, only the COVID-19 ID Physician on-call can approve patients who require swabs. Please ensure you're up-to-date with your respective institutions policies.
- The name of the COVID-19 swab test is different in different institutions. Please familiarize yourself with your respective institutions order details.

It is a very difficult time for all of us as healthcare professionals, especially yourselves as you are just about to embark on your journey as a physician. Please know that we are all here to give you any support that you may need. Here are some tips for work that you should be aware of!

Tip 1: Always wear face masks in clinical areas. At least N95 mask with PPE in pneumonia/ isolation wards! Please refer to intranet for updated information on PPE required for different locations.

Tip 2: Wash your hands frequently and especially before you start work, take breaks/ have meals and leave work!

Tip 3: Check with your seniors whether certain patients require clearance for COVID-19. Never be afraid to ask – Silence is definitely not golden at this juncture!

Tip 4: Visit your hospital's intranet to keep yourself updated regarding the suspected case definition – allowing you to identify patients who may have COVID-19 infection. In addition, you can also keep yourself updated as there will be a list of clusters that you will need to use as a contact history screen for your patients.

Tip 5: Help each other out – nobody is ever alone and let us all make sure that every individual is well supported during this challenging time. Stay United and we will overcome this!

6) Common Acronyms

Please check with your respective institutions for the approved acronyms.

Acronym	What It Stands For
a/w	Associated with
AAA	Abdominal aortic aneurysm
ABG	Arterial blood gas
ADL	Activities of daily living
BNO	Did not open bowels
BP	Blood pressure
BPH	Benign prostatic hyperplasia
BS	Bowel sounds
BTS	Blood Transfusion Service
CKD	Chronic kidney disease
COPD	Chronic obstructive pulmonary disease
CPR	Cardiopulmonary resuscitation
CRP	C reactive protein
CXR	Chest X-ray
DRE	Digital rectal examination
DNR	Do not resuscitate
DVT	Deep vein thrombosis
ECG	Electrocardiogram
FBC	Full blood count
FFP	Fresh frozen plasma
GCS	Glasgow coma scale
GERD	Gastroesophageal reflux disease
GXM	Group X-match (cross-match)
HR	Heart rate

Hb	Haemoglobin
HDU	High Dependency Unit
ICA	Intermediate Care Area (similar to HDU)
ICU	Intensive care unit
IDC	Indwelling urinary catheter
In situ	In place
IV	Intravenous
JVP	Jugular venous pressure
KUB	Kidney, ureter and bladder
LFT	Liver function test
MC	Medical certificate
MRI	Magnetic resonance imaging
NAD	No abnormality detected
NBG	No bacterial growth
NBM	Nil by mouth
NKDA	No known drug allergy
NPU	Not passing urine
O/E	On examination
OGD	Oesophago-Gastroduodenoscopy
OM	Omni mane (every morning)
OPS	Outpatient polyclinic service
OT	Operating theatre
PCT	Packed red blood cells
Plt	Platelet
PO	Per oral
PR	Per rectal
PRN	Pro re nata (as necessary)
Q_H	Every _ times hourly

QDS	Quarter die sumendus (4 times a day)
RA	Room air
RR	Respiratory rate
S1S2	First and second heart sounds
SpO2	Oxygen saturation
TCU 2/52, FBC OA	To be seen in clinic in 2 weeks' time, with a full blood count test to be done on arrival at the clinic.
TCU OPS	TCU – To see you OPS – Outpatient service
TDS	Ter die sumendum (3 times a day)
TW	Total white (cell count)
UFEME	Urine full examination microscopy elements
URTI	Upper respiratory tract infection
UTI	Urinary tract infection

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