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Policy note:
Learning from international experience to improve appropriateness of hospital admissions in Vietnam's health system

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Abbreviations

AEP	Appropriateness Evaluation Protocol
DRG	Diagnosis-related groups
ECG	Electrocardiogram
EU	European Union
GP	General practitioner
MOH	Ministry of Health
NEWS	National Early Warning Score
OECD	Organization for Economic Cooperation and Development
TM	Traditional medicine
US	United States
VSS	Vietnam Social Security

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Introduction

Hospital overcrowding and pressure on Vietnam's social health insurance fund from a growing rate of admissions (rising from 6.5 to 8.0 per 100 people between 2008 and 2018) has recently been exacerbated by a policy that allows patients to access inpatient services at provincial and lower level hospitals without any referral or additional copayments (implementation of Article 22 of the amended Law on Health Insurance 2014). In response, the Ministry of Health (MOH) is developing policies on hospital admissions criteria in emergency cases and in traditional medicine hospitals as part of a strategy to reduce avoidable admissions. Collaboration between the MOH and Vietnam Social Security (VSS) in developing these criteria and designing ways to use them as part of claims review has potential for both enhancing quality and appropriateness of healthcare services, improving patient safety and convenience by avoiding unnecessary hospital stays and enhancing efficiency and cost-savings that would enhance sustainability and effectiveness of health insurance fund use. Claims review is defined in the Health Insurance Law as "*the specialized activity implemented by the health insurance organization aimed at assessing the appropriateness of medical services provided to insured patients and serving as the basis for payment of medical care costs*."

Examination of admissions policies and criteria used in other health systems can help guide Vietnam's policy development. Review of experience in other countries is helpful because admissions policies and criteria have undergone long periods of study, validation, and refinement over time. This can help Vietnam's health system save time and help avoid mistakes in developing similar policies, particularly in moving towards DRG payments for admitted care. Under DRG payments, there may be more of an incentive for admitting patients unnecessarily unless volume caps are imposed. The admissions criteria in use in other countries have been evaluated to ensure that they can be used consistently across providers and that they lead to good health outcomes for patients. In addition, the admissions policies and criteria are likely to have gone through a consensus-building process between the health authorities, health care providers and purchasing agencies, and have evolved to a form that is considered acceptable to all parties.

This technical note introduces sets of general admission criteria used internationally, with a focus on examples from the United States, European Union and Australia. It summarizes and assesses the currently proposed admission criteria for Vietnam and provides recommendations to consider while developing the Vietnamese policy. The references contain further examples of admission criteria used in different health systems. Annex A provides additional criteria for assessing additional days of inpatient care, Annex B provides some examples of specialty-specific scores, scales and protocols that can be adopted to guide admission decisions for specific types of disease or medical specialties. Annex C provides some table templates and indicator definitions for some initial analysis of claims data on admission types. This can be further developed once the indicators are tested and results reviewed. It is hoped that this technical note can help in setting explicit admissions criteria to create appropriate provider expectations, enhance transparency and reduce ambiguity during claims review, helping to reduce conflicts in the third party purchasing of health services.

International use of hospital admission appropriateness assessment

Three key elements of hospital admission appropriateness assessment consist of:

1. Defining admitted versus non-admitted care
2. Criteria for assessing appropriateness of admission and their use
3. Assessing underlying reasons for inappropriate admission

Defining admission and various classifications of admission for payment purposes

An admission order by a qualified doctor generally determines the admitted episode of care. Regulations on these admission orders are often affected by rules for payment or patient safety regulations. OECD defines inpatient care as care for a patient who is formally admitted (or hospitalized) to an institution for treatment and/or care and stays for a minimum of one night in the hospital providing inpatient care.[1] In Australia's payment system an admission is defined as the formal process of a hospital accepting responsibility for the patient's care and/or treatment following a clinical decision based upon specified criteria that a patient requires same-day or overnight care or treatment. For each admission, there must be documentation in the patient's health record by the admitting clinician, or another authorized clinician, that supports the need for admission.[2] In the United States Medicare system, hospital admission requires a formal order for inpatient care and treatment made by a qualified medical practitioner with knowledge about the patient's condition.[3] The clinician's order must meet two requirements: a) a reasonable expectation based on clinical reasons and standards of medical practice that the patient is likely to require two days or more of inpatient care and b) a specific explanation of the clinical conditions, circumstances, complications, comorbidities and risks to the patient upon which that expectation is based (See Box 1). Clinical needs of patients are paramount in determining the need for admitted care and this need must be carefully documented in the patient records so they can be assessed against reasonable standards of medical practice within the health system.

Box 1: Specific items to be documented in a doctor's inpatient admission decision, US Medicare system

Instructions from Medicare request doctors to consider and document the following information when making an inpatient admission decision:

- Severity of presenting signs and symptoms
- Severity and number of acute conditions requiring care and management
- Any pertinent pre-existing chronic conditions or other comorbidities complicating the patient's care
- Risks associated with the conditions or findings identified
- Any authoritative professional guidelines or evidence-based medical literature supporting inpatient admission (such as ABCD2[4] score >3 for transient ischemic attack, Pneumonia Severity Score >90, etc.)
- Extenuating circumstances contributing to the medical necessity of inpatient admission like advanced age, poor compliance, limited understanding, lack of social support (these circumstances are not by themselves sufficient reason for admission, but support the need for inpatient care when an acute condition arises).

Example of doctor's order that meets the requirements: "*Ms. Smith is expected to need two days or more of inpatient care for the management of pneumonia associated with an acute exacerbation of COPD having a significant risk of progression to respiratory failure or sepsis and complicated by advanced old age, diabetes and immune suppression due to steroids.*"

Source: https://acphospitalist.org/archives/2013/09/coding.htm

[1] https://stats.oecd.org/glossary/detail.asp?ID=1364

[2] https://www.aihw.gov.au/reports-data/myhospitals/content/glossary

3 https://www.law.cornell.edu/cfr/text/42/412.3 Title 42- Public Health, Chapter IV-Centers for Medicare & Medicaid Services Department of Health and Human Services, Subchapter B-Medicare Program, Part 412-Prospective Payment systems for inpatient hospital services

[4] Age, Blood pressure, Clinical features, Duration of TIA, and presence of Diabetes used in a score to predict risk of stroke in patients experience a transcient ischemic attack TIA). https://pubmed.ncbi.nlm.nih.gov/17258668/ and https://pubmed.ncbi.nlm.nih.gov/18688003/

Emergency department care is not generally considered as admitted care, although most non-surgical patients are admitted to specialist inpatient care through the emergency department. Patients received in the emergency department may be treated and discharged, transferred, sent to an observation ward, or admitted for specialist care usually within a four-hour period from arrival. In Australia, a special DRG payment classification for emergency department care has been developed to pay for emergency department services separate from admitted care.[5] It should be noted that not all patients are admitted through the emergency room, some are referred from other facilities, and some may be admitted for elective surgeries (planned in advance) based on decisions made by specialists, while a few may be admitted as emergencies through an outpatient department or clinic.

Observation services or short-stay admissions are a category of care between emergency department and specialist admission, with care provided in a unit attached to the emergency department (such as the Australian short-stay unit). This category of care is used when the emergency department cannot make a definitive decision within about 4 hours whether to admit the patient or discharge them. This inability to make a decision quickly may be due to factors such as requiring a longer period of time to get paraclinical results or for the emergency interventions to have the intended effect allowing for discharge. Observation may involve an overnight stay, but there is usually a short time threshold (less than 48 hours or before the second night) when a decision must be made to admit the patient to a specialist department, transfer to another facility or discharge the patient. Admission criteria for observation services or short-stay admitted care have also been developed, to standardize case management for certain case types and ensure patient safety, but also to facilitate provider payment design.[6]

Depending on clinical need, a patient may be admitted for different types of care, which may require different criteria for assessing appropriateness. Care type refers to the nature of a clinical service provided to a patient during an episode of care and can be used for both admitted and non-admitted care. In Australia, the payment mechanism for inpatient care is designed around a range of explicitly defined care types including acute care, sub-acute care and non-acute care (Box 2).[7] Australia further subdivides admitted care into overnight care and three categories of same-day care and two categories of newborn care (Table 1). Same-day care is defined as care for a patient who is admitted and discharged on the same date. In the United States, admission as an inpatient usually requires an overnight stay, however an overnight stay for observation could be considered as outpatient care for provider payment purposes. Many surgical services, rehabilitation treatments, as well as mental health services are available as outpatient services if the patient is allowed to leave the hospital on the same day as receiving the service. In the United States sub-acute care for Medicare payments is defined in detail as medically necessary care obtained in an inpatient rehabilitation facility or unit, based on a doctor's certification of the medical condition requiring intensive rehabilitation, continued medical supervision and coordinated care from doctors and therapists working together.[8] Mental health care has received special attention in designing of admission criteria and classification of care type for use in DRG payment systems, but will not be discussed in detail in this technical note.[9]

[5] https://www.ihpa.gov.au/what-we-do/emergency-care

[6] An example can be found at https://www.acep.org/globalassets/uploads/uploaded-files/acep/clinical-and-practice-management/resources/observation/eou-procedures-and-protocols-highland-hospital.pdf

[7] IHPA (AIHW). Development of nationally consistent subacute and non-acute admitted patient care data definitions and guidelines. 2013. https://www.aihw.gov.au/getmedia/01d815ba-3d66-48c9-a9ec-aaa5825c19f2/15425.pdf

[8] https://aspe.hhs.gov/basic-report/subacute-care-review-literature

[9] https://www.ihpa.gov.au/what-we-do/mental-health-care

Box 2: Australian admitted care types affecting provider payment design

Acute care: Care in which the intent is to ***perform surgery, diagnostic or therapeutic procedures in the treatment of illness or injury***. Management of childbirth is also considered acute care.

Sub-acute care: Specialized multidisciplinary care [involving 2 or more types of health workers like physical therapist, case manager, occupational therapist, physician, etc.] in which the primary need for care is ***optimization of the patient's functioning and quality of life***, such as rehabilitation or palliative care***.***

Non-acute care (maintenance care): care in which the primary clinical purpose or treatment goal is ***support for a patient with impairment, activity limitation or participation restriction due to a health condition.*** Following assessment or treatment, the patient does not require further complex assessment or stabilization within the scope of acute care, and patients may require care over an indefinite period.

Sources: https://www.aihw.gov.au/reports-data/myhospitals/content/glossary; https://www.ihpa.gov.au/what-we-do/subacute-and-non-acute-care

Table 1: Admission categories in Australia

Type O	Acute overnight admission
Type OS	Subacute overnight admission (e.g. rehabilitation, palliative care)
Type ON	Non-acute overnight admission (e.g. maintenance care, nursing home)
Type E	Same Day[10] Extended medical treatment (continuous active management of at least 4 hours duration); this category includes patients transferred from emergency department to short-stay units.
Type C	Same Day non-admitted procedure (based on non-admitted procedure list and special patient conditions justifying admission)
Type B	Same Day admitted procedure (based on list of admitted procedures)
Type Q	Qualified newborn
Type U	Unqualified newborn

Use of admission criteria

While the admission of a patient into the hospital is based on a complex clinical decision-making process, admission criteria can be used to systematically assess those decisions. Health systems have to rely on doctors to make admission decisions for their patients based on their specialized training and clinical judgement and in accordance with accepted medical practice standards. The doctor's decision to admit a patient is a very complex decision that must consider patient history, clinical exam, paraclinical results, epidemiology, technical capacity of the facility and even social factors. Doctors are often guided by various decision-support tools, severity scores and other guidelines that have been developed and validated in different settings for different specialties or specific medical conditions (See Annex B for some examples). However, it is still widely acknowledged that artificial intelligence or standardized instruments cannot replace the human element of a doctor's decision to admit a patient, nor be used in an automated way, such as in claims review, to reject individual admission decisions made by doctors.

[10] Same day means that the admission and discharge occur on the same day. Australia also has short-stay admissions, which are admission to a short-stay unit managed by Emergency Department staff, designated and designed for the **short term** (generally up to 24 hours) treatment, observation, assessment and reassessment of patients initially triaged and assessed in the Emergency Department.

Benchmarking of rates of inappropriate admission and systematic assessment of underlying reasons for inappropriate admissions can be important parts of quality improvement cycles, but can also be incorporated into provider payment mechanisms and contracting. Using admission criteria agreed upon by the MOH and hospitals, a standardized documentation of the clinical justification for an admission decision can be incorporated into the documentation for insurance claims. The MOH and the health insurance agency can use this information to assess the rate of clinically appropriate (or inappropriate) admissions. Hospitals, health authorities and the health insurer can assess the underlying reasons for clinically inappropriate admissions and propose strategies to avoid unnecessary admissions. Hospitals with excess rates of inappropriate admissions can be subject to greater scrutiny of admission decisions or financially penalized if the behavior persists. Pre-approval mechanisms by a professional association or other independent entity could be developed for specific types of non-emergency (elective) admissions that are likely to be overprescribed (such as Phaco surgery).

A widely used instrument for assessing appropriateness of admissions is the Appropriateness Evaluation Protocol (AEP). The AEP is a review instrument designed to assess the clinical appropriateness of two critical inpatient care decisions: a) admission and b) an additional day of inpatient care. This protocol covers emergencies, elective surgery and other admitted case types. The AEP has been used in the United States and Europe since the 1980s, with improvements incorporated into the protocol over time. The first part of the AEP consists of clinical criteria designed to evaluate *inappropriate use of hospital inpatient care and inappropriate additional days of inpatient care that are not clinically justified*. The AEP used in the United States is presented in Table 2 for a version of admission criteria used in the United States, with EU variations presented in italics enclosed in square brackets. Annex A provides the criteria used for assessing additional day of inpatient care.

The AEP has been scientifically validated for use in various health system contexts. [11,12,13] Validation generally involves assessment of the impact of applying the protocols on various outcomes such as mortality, avoidable adverse events (such as secondary admission within 7 days), quality of life, length of stay, patient satisfaction, discharge destination and admissions. Another important criterion for validation of the instrument is inter-rater reliability, which means that the results of the assessment remain consistent regardless of who does the assessment.

The AEP contains 20 concrete criteria for assessing a patient's need for acute care admission to the hospital. Several features of the AEP criteria should be noted. First, these criteria tend to be general rather than disease-specific. Second, the criteria include quantitative thresholds, time reference periods, or frequency of intervention to reduce ambiguity. Third, they can be verified through information reported in the patient record or in electronic health records. Fourth, they include criteria reflecting both intensity of the services being provided and the severity of the patient's condition. Fifth, they include not only criteria for assessing admission, but also assessing discharge (i.e. whether an additional inpatient day is clinically necessary) (See Annex A: Criteria for appropriateness of another day of inpatient care).

[11] For example, in Korea in 2019. Lee, Clara, Stella Jung-Hyun Kim, Changwoo Lee, and Euichul Shin. "Reliability and Validity of the Appropriateness Evaluation Protocol for Public Hospitals in Korea." *Journal of Preventive Medicine and Public Health* 52, no. 5 (2019): 316.
https://www.jpmph.org/journal/view.php?number=2042

[12] Meidani, Zahra, Mehrdad Farzandipour, Mehrdad Hosseinpour, Davood Kheirkhah, Manizheh Shekarchi, and Shahla Rafiei. "Evaluating inappropriate patient stay and its reasons based on the appropriateness evaluation protocol." *Nursing and Midwifery Studies* 6, no. 3 (2017): 121-124.

[13] Soria-Aledo, Víctor, Andrés Carrillo-Alcaraz, Benito Flores-Pastor, Alfredo Moreno-Egea, Milagros Carrasco-Prats, and José Luis Aguayo-Albasini. "Reduction in inappropriate hospital use based on analysis of the causes." *BMC health services research* 12, no. 1 (2012): 1-10.

Table 2: Clinical criteria for assessing appropriateness of hospital admission (Part I) in AEP[14]

I. Admission Criteria	
IA	**Intensity of service**
IA1	Procedure requiring general/regional anesthesia or resources available only for inpatients *[EU version specifies surgery or other procedure in 24 hours]*
IA2	Telemetry, bedside cardiac monitor, or monitoring of vital signs at least every 2 hours
IA3	Intravenous medications and/or fluid replacement (does not include tube feedings)
IA4	Observation for toxic reaction to medication
IA5	Intramuscular antibiotics at least every 8 hours *[not in EU AEP]*
IA6	Intermittent (at least every 8 hours) or continuous respirator use
IB	**Severity of illness**
IB11	Severe electrolyte or blood gas abnormality-any one of the four following sets:
	a) Na<123 mEq/L or > 156 mEq/L
	b) K<2.5 mEq/L or >5.6 mEq/L *[EU AEP sets upper limit at 6.0 mEq/L]*
	c) HCO_3<20 mEq/L or HCO_3 > 36 mEq/L
	d) Arterial pH < 7.3 or > 7.45
IB12	Loss of sight or hearing within 48 hours of admission *[EU AEP specifies acute loss]*
IB13	Loss of ability to move a limb or other part within 48 hours of admission *[EU AEP specifies acute loss]*
IB14	Persistent fever, 37.8° C (Oral) or 38.3° C (Rectal) for more than 5 days *[EU AEP specifies fever of 38 °C]*
IB15	Active bleeding
IB16	Evisceration or dehiscence[15] of surgical wound *[EU version does not limit to surgical wound]*
IB17	Pulse rate: < 50 per minute or > 140 per minute
IB18	Abnormal blood pressure
	Systolic < 90 or > 200 m Hg; and/or
	Diastolic < 60 or > 120 mmHg
IB19	Acute confusional state, coma, or unresponsiveness *[EU AEP does not include confusional state, and specifies sudden onset]*
IB20	ECG evidence of acute ischemia, must be suspicion of new myocardial infarction

Admissions for elective medical procedures often depend on the type of procedure to be performed, assuming that the doctor has ordered the procedure in a clinically appropriate way following standard guidelines. Many medical procedures can be performed on a non-admitted basis, such as radiotherapy or dialysis, while a growing range of surgeries can be performed on a day surgery basis (such as Phaco, hernia or even knee replacement surgery), while some more complex surgeries, such as cardiothoracic surgery, generally require overnight admission due to the type and/or duration of anesthesia, and/or level of invasiveness. In the United States where day surgery predominates, Medicare has historically relied on an approved list of "inpatient only" procedures as the main criteria for assessing appropriateness of overnight admission for elective surgery.[16] In the varied hospital admission policies of Australian states, admission eligibility is determined by the automatically admitted procedure list (or Type B admittable procedure list) and the not automatically qualified for admission list (Type C non-admitted procedure list) to distinguish the admission status to be used for different medical procedures.[17,18] Doctors in Australia can override the Type C list if there are special circumstances relating to a patient that justify the care being

[14] Lang, Thierry, Alessandro Liberati, Antonio Tampieri, Guido Fellin, M. L. N. L. Gonsalves, Susana Lorenzo, Maggie Pearson, Roger Beech, and B. Santos-Eggiman. "A European version of the appropriateness evaluation protocol." *International journal of technology assessment in health care* 15, no. 1 (1999): 185-97.

[15] Dehiscence means a surgical complication where the edges of a wound no longer meet and evisceration means disembowelment.

[16] https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalOutpatientPPS Click on link to Addendum E.

[17] https://www2.health.vic.gov.au/about/publications/policiesandguidelines/vaed-reporting-procedure-code-lists-2018-19

[18] https://ww2.health.wa.gov.au/-/media/Files/Corporate/Policy-Frameworks/Information-management/Policy/Admission-Readmission-Dischargeand-Transfer-Policy/MP58-Admission-Readmission-Discharge-and-Transfer-Policy.pdf

provided on an admitted basis, and these circumstances are documented in the patient record by the treating clinician. It is, however, expected that there will be few cases like this, and the number and justifications will be closely reviewed.[19] Clinical decisions about same-day vs. overnight admission for surgery often rely on criteria related more to the patient's condition and the facility's preparedness to perform procedures as day surgery cases.[20]

Admission criteria for sub-acute care such as rehabilitation are quite different than for acute care. First, the nature of the need for medical care would not be an acute condition, but physical impairment or problems with cognitive function and communication. Second, the impairment must be of recent onset or progression/exacerbation. Third, the patient must be stable and not require acute care. Fourth, the patient must be able to tolerate long periods of therapy per day on a daily basis. Fifth, the patient requires care from multiple disciplines (e.g. physical therapy and nutrition), which would otherwise require visits to multiple different providers each day. Sixth, the patient must be able to make functional progress within a reasonable amount of time following a care plan that contains clear criteria for discharge, such as achievement of goals, plateaued and no longer progressing, becoming medically unstable requiring acute care, or refusing to cooperate.[21]

Triage criteria are generally used in emergency departments to distinguish patients in order of their need for time-critical interventions (clinical urgency). For example, the Australasian Triage scale classifies patients into five categories: immediate care, and care within 10, 30, 60 and 120 minutes. Note that triage scales are primarily used for clinical purposes like patient safety, to ensure that the most urgent cases are treated first and may be less useful for claims review of admissions for payment purposes. It is possible that a patient put in the immediate care category at time of presenting to the emergency department could be sent home without admission once the medical emergency has been dealt with (e.g. asthmatic crisis or allergic reaction). It is important, therefore, to distinguish triage criteria from complexity or severity, or even criteria to assess the need for admitted care.[22]

Early warning scores are another type of instrument to trigger clinical decision-making. In recent years National Early Warning Scores (NEWS) have been developed to quickly determine the degree of illness of an admitted patient based on a composite set of vital signs (respiratory rate, oxygen saturation, temperature, blood pressure, pulse/heart rate, AVPU[23] response). These scores guide appropriate care for patients already in the hospital and can be used in coding auditing, however these are not criteria for deciding on or assessing appropriateness of admissions.

Auditing inappropriate admissions

Using the AEP criteria allows identification of clinically inappropriate admissions. However, further investigation is needed to understand why doctors may be making inappropriate admission decisions. Other factors may be at play, for example, if a patient has come from a remote village for the birth of a baby, but is not yet in active labor, the doctor may still order admission. Additional sets

[19]https://ww2.health.wa.gov.au/~/media/Files/Corporate/Policy%20Frameworks/Information%20management/Policy/Admission%20Readmission%20Dischargeand%20Transfer%20Policy/Supporting/Admission-Policy-Reference-Manual.pdf

[20] https://www.safetyandquality.gov.au/sites/default/files/migrated/National-Safety-and-Quality-Health-Service-Guide-for-Day-Procedure-Services.pdf

[21] https://www.gwhospital.com/conditions-services/rehabilitation-services/admission-discharge-criteria

[22] Australasian College for Emergency Medicine. "Guidelines on the implementation of the Australasian triage scale in emergency departments." G24 (2000).

[23] A scale widely used to grade a patient's gross level of consciousness, responsiveness, or mental status based on the following distinct criterion: Alert, Verbally responsive, Painfully responsive and Unresponsive. https://www.ncbi.nlm.nih.gov/books/NBK538431/

of criteria have been developed that can be used to evaluate reasons for clinically inappropriate admissions (Table 3).[24]

Table 3: Tool to evaluate underlying reasons for inappropriate admission

	Reason (AEP)	Suggested preferred actions
1	Premature admission (e.g. scheduled admission on Monday for surgery on Friday)	Postpone admission until the day of or day before surgery.
2	Expert opinion and/or investigation necessary for decision to admit could not be obtained in due time	Transfer patient to observation bed until clinical results are available
3	Admission to avoid the waiting time for an outpatient investigation	Work to reduce waiting times for outpatient services
4	Conservative practice (i.e. medical treatment is beyond standards of practice).	Develop more specific protocols with detailed criteria to guide clinicians in avoiding unnecessary admissions
5	A lower level of care does not exist	Ensure that primary care facilities or home health care are available.
6	A lower level of care could not be achieved (excluded outpatient care)	Work to facilitate use of lower level care
7	Admission required by the general practitioner (GP) or specialist	Educate GPs or specialists on clinical criteria for admission, incentivize them to comply with those criteria.
8	Admission demanded by the patient or the family	Educate the patient on why admission is not needed
9	Admission to facilitate an investigation that would otherwise incur costs for the patient (e.g. admit patient from remote areas to avoid costs of accommodation).	Find alternative ways to resolve this problem, such as a hospital guest house
10	Social problems	Mobilize social workers, family members to resolve problems that prevent the patient from staying at home (e.g. domestic violence, elderly person with no caregiver)
11	Others (to be specified)	

Special circumstances can often justify individual cases of clinically inappropriate admission, however, broad patterns of inappropriate admissions can be assessed and used as part of quality improvement and claims review processes. High rates of inappropriate admissions found in some hospitals or departments can lead to greater targeting of quality improvement interventions as well as increased intensity of claims review. Using transparent criteria and presenting evidence to hospitals of deviation from standard medical practice can contribute to reducing inappropriate admissions. Contracts between hospitals and the health insurance agency could also stipulate expectations for rates of appropriate admission.

Vietnam's development of admission criteria

Institutional interest in admission criteria

Health insurance claims review assesses appropriateness of medical services provided to insured individuals based on criteria defined by various regulations, guidelines and standards of the Ministry of Health. According to the Health Insurance Law (2008) and amendments (2014), health insurance claims review is the professional activity implemented by the health insurance organization to assess the appropriateness of the medical services provided to insured individuals and is the basis for payment of insured healthcare services. The claims review function helps to

[24] Lang, Thierry, Alessandro Liberati, Antonio Tampieri, Guido Fellin, M. L. N. L. Gonsalves, Susana Lorenzo, Maggie Pearson, Roger Beech, and B. Santos-Eggiman. "A European version of the appropriateness evaluation protocol." *International journal of technology assessment in health care* 15, no. 1 (1999): 185-97.

protect the rights of insured patients while also contributing to controlling costs by detecting and intervening to reduce unnecessary care and fraudulent claims. As part of current VSS regulations (Quyết định 1456/QĐ-BHXH), claims reviewers are expected to check on appropriateness of emergency admissions for patients who present at a hospital without a referral by examining the clinical signs, paraclinical results, drugs prescribed and technical services ordered, however the MOH has not issued a concrete list of emergency admission criteria to ensure the standardization of claims review assessment of appropriateness of admissions.

Claims review in Vietnam relies on statistical assessment of claims data followed by targeted manual checking of records in facilities with many implausible cases. The claims review database contains a large number of data items defined in MOH Decision 4210 (2017) including primary and many secondary diagnoses, procedure codes, age, sex, and a large number of individual inputs to care used to determine payment in the fee-for-service system. Currently the data item named "reason for admission" [MA_LYDO_VVIEN], requires hospitals to choose one of four codes: 1-correct level of care; 2-emergency case; 3-incorrect level of care not allowed by policy; 4-incorrect level of care allowed by policy.[25] While this may be needed to ensure patient entitlement to insurance coverage when seeking inpatient care at provincial and higher levels of care, it is less helpful for assessing appropriateness of admission. Assessing modality of admission through emergency room, outpatient department, referral or for schedule surgery or procedures may be a more useful way to classify admissions for assessment of appropriateness. Assessment of the nature of very short admissions may also be helpful in assessing appropriateness of admission. The Annex C to this policy note proposes how the data specified in 4210 could be used to define these categories.

The statistical assessment in VSS claims review focuses on cases coded as emergency case, where admitted patients are eligible for full coverage even if they sought care at a higher level facility without a referral. These cases are assessed for evidence that the disease, use of drugs or technical services is not appropriate for emergency admission. For surgical cases, statistical assessment examines whether the diagnosis, severity, age, gender of the patient are appropriate with the order for surgery. Because there are no clear concrete criteria, it is very difficult for claims reviewers to determine if an admission is inappropriate and deny payment for the whole case, and in most cases payment is denied for only part of the charges for which solid evidence of inappropriateness is present. The claims review database contents described in Decision 4210 do include data fields that could be used for a more standardized way of recording the justification for the admission decision, specifically, Table 4 (paraclinical results) and Table 5 (clinical progress monitoring). Currently these allow hospitals to enter free text data, but they are not structured in a way that guides hospitals in what they should enter. Currently many hospitals neglect to enter information in these tables.

Currently Vietnam's MOH has not yet issued any criteria to guide admission decisions or to form a legal basis for VSS to assess appropriateness of admissions and discharge. Currently patient records do not have a field to enter the clinical or non-clinical justification for admissions, only a field to enter the complaint for which the patient has sought care at the facility. There is no general list of admission criteria to serve as a general guide for doctors to use in determining a justification for their admission decision through the emergency room, or even for referrals or patients seen in the outpatient clinic. In addition, most diagnosis and treatment guidelines for specific conditions lack criteria, scores, protocols or instruments to guide admission and discharge decisions. Consequently, the VSS claims review process lacks concrete rules that can be applied for assessing appropriateness of admission.

In 2021, the Ministry of Health is developing two sets of admission criteria, one for emergency admissions (proposed by the Medical Services Administration) and the other for traditional medicine (TM) admissions (proposed by the Traditional Medicine Administration). It does not appear that any general admission criteria policy is being developed, nor specific policies related to

[25] In Vietnamese this is: 1-đúng tuyến; 2-cấp cứu; 3-trái tuyến; 4-thông tuyến.

categorizing surgeries and procedures that require admission as exists in other countries. There is no explicit mention that the admission criteria being developed are expected to be used in health insurance claims review.

Table 4: The stated purpose of the proposed Vietnamese admission criteria policies

Emergency admission	Traditional medicine admission
Ensuring that admission is appropriate with the status of the disease	Ensuring that ordering a patient to be admitted is appropriate and ensuring the rights of the patients
Limiting as much as possible the overcrowding of hospitals, especially the provincial and central hospitals	Improving the quality of TM and TM-Modern medicine combined curative care
Ensuring the maintenance and stability of the curative care system when implementing the policy of allowing free choice of inpatient facility up to the provincial level under the health insurance policy	Ensuring the maintenance and development of the TM curative care system in each locality when implementing the policy of free choice of inpatient facility up to the provincial level under the health insurance policy

The proposed traditional medicine admissions policy goes beyond clinical criteria to cover facility capacity and social criteria (Table 5). Criteria on capacity of the health facility to provide care is included in the traditional medicine criteria, but not in the emergency admission policy. In an emergency situation, patients may need to be provided urgent care and stabilized even if the health facility does not have the capacity to provide the care they need. However, it is understood that capacity to provide services needed by the admitted patient would be a mandatory criterion for admission, and that if the facility lacks such capacity, the patient would be transferred to another facility to get the care they need, although these criteria are not mentioned. The traditional medicine admission criteria also include some of the justifications for non-clinically justified admissions including distance from home to the health care facility and patient circumstances, although these are somewhat vague.

Table 5: Current draft proposal from the MOH for general principles for emergency admission and traditional medicine admissions

Emergency admission (Medical Services Administration)	Traditional medicine (Traditional medicine administration)
The patient's condition requires clinical management	Health and medical condition situation of the patient based on clinical or paraclinical information at the health facility
The patient requires monitoring, assessment or diagnosis and clinical management	Prognosis for changes in medical condition requires monitoring, treatment for at least 24 hours from the time the patient presented at the health facility
The patient requires daily assessment on their status, course of disease and effectiveness of treatment	
Besides the above criteria, the order for emergency admission is the doctor's decision and he/she will be accountable for this decision on each specific case.	Besides the above criteria, ordering 24/24 admission is the decision of the doctor who is responsible for his decision in each specific case.
Not mentioned	Ensuring that the infrastructure and equipment meet the care and treatment needs of the patient throughout the treatment process at that health facility Ensure the ratio of health workers per bed is appropriate with the treatment method
Not mentioned	Administrative unit/geographic distance Specific context or conditions of the patient

Assessing the proposed Vietnamese emergency admission criteria through comparison with the AEP

The draft Vietnamese policy for emergency admissions currently contains two lists of criteria. The first consists of mostly individual symptoms and signs that could indicate a medical emergency. The second list is grouped, more or less, by specialty and provides longer lists or sets of criteria for admission. There is some overlap between the two lists. The Vietnamese criteria have been roughly matched to the structure of the AEP criteria to facilitate analysis of gaps and differences. Table 6 lists the AEP criteria and the Vietnamese criteria that most closely match. Comparison helps to guide further refinement of the Vietnamese policy:

- The Vietnamese criteria focus on illness severity and have few service intensity criteria as in the AEP, for example cases requiring monitoring every 2 hours, requiring intravenous medication or severe wound and wound that is not healing.
- Some of the Vietnamese criteria lack concrete thresholds or details to distinguish clearly between those that require and those that do not require admission, for example fainting, weakness or chest pain.
- In other cases the Vietnamese criteria may be too narrow and specific, such as acute cranial nerve palsy rather than more general paralysis criteria.
- It also appears that in some cases, it is not an individual criterion, but a set of criteria that are being proposed, suggesting that a disease-specific protocol may be useful, such as a stroke protocol that would help in identifying the constellation of symptoms that together indicate a case requiring admitted care.
- The Vietnamese policy proposes additional criteria that are not listed in the AEP, including for pain, poisoning,[26] injury, burns, smoke inhalation, near drowning, abscess, and diffuse inflammation (not clear if this means cellulitis?).

Table 6: Comparison of Vietnam's proposed emergency admission criteria with the AEP criteria

I. Admission Criteria in AEP		**Vietnamese criteria**
IA	**Intensity of service**	
IA1	Procedure requiring general/regional anesthesia or resources available only for inpatients *[EU version specifies surgery or other procedure in 24 hours]*	Excluded because Vietnamese policy focuses on emergency admissions and traditional medicine.
IA2	Telemetry, bedside cardiac monitor, or monitoring of vital signs at least every 2 hours	Not mentioned
IA3	Intravenous medications and/or fluid replacement (does not include tube feedings)	Not mentioned
IA4	Observation for toxic reaction to medication	Appearance of anaphylaxis after using pharmaceutical, after eating or drinking, after being stung.
IA5	Intramuscular antibiotics at least every 8 hours *[not in EU AEP]*	Not mentioned
IA6	Intermittent (at least every 8 hours) or continuous respirator use	Not mentioned, but related to difficulty breathing
IB	**Severity of illness**	
IB11	Severe electrolyte or blood gas abnormality- any one of the four following sets:	
	a) Na<123 mEq/L or > 156 mEq/L	• Severe or persistent vomiting or severe or prolonged diarrhea *[Suggests dehydration]*
	b) K<2.5 mEq/L or >5.6 mEq/L *[EU AEP sets*	

[26] Aki, Ehab Said, and Jalal Alessai. "General Approach to Poisoned Patient." In Poisoning in the Modern World-New Tricks for an Old Dog?. IntechOpen, 2019.

I. Admission Criteria in AEP		Vietnamese criteria
	upper limit at 6.0 mEq/L]	• Not eating or drinking anything *[unclear if patient is unable to eat or drink, or chooses not to eat or drink=>anorexia]*
	c) HCO3<20 mEq/L or HCO3 > 36 mEq/L	• Abnormal respiratory rate: Difficulty breathing, rapid breathing, episodes of stopping breathing • Cyanosis • Suffocation (Apnea) • Developing paralysis with signs that it is affecting respiration
	d) Arterial pH < 7.3 or > 7.45	
IB12	Loss of sight or hearing within 48 hours of admission *[EU AEP specifies acute loss]*	• Sudden dizziness, reduction or loss of vision and/or field of vision • Acute sensory disturbance *[clarify if touching cannot feel anything]*
IB13	Loss of ability to move a limb or other part within 48 hours of admission *[EU AEP specifies acute loss]*	• Signs of acute stroke: paralysis, trouble speaking, sensory disturbances, vision disturbance, sudden dizziness • Weakness, • Acute motor paralysis • Acute cranial nerve palsy *[May be too specific, and more general paralysis criteria could be proposed]*
IB14	Persistent fever, 37.8° C (Oral) or 38.3° C (Rectal) for more than 5 days *[EU AEP specifies fever of 38°C]*	• Body temperature disorder: Temperature too high or extremely low
IB15	Active bleeding	• Coughing up blood • Uncontrollable or difficult to control bleeding/ loss of a large amount of blood • Vomiting blood, defecating blood, black stool at a severe level
IB16	Evisceration or dehiscence[27] of surgical wound *[EU version does not limit to surgical wound]*	• Deep or large wound *[may need more detailed criteria on severity, infection, location, etc.]*
IB17	Pulse rate: < 50 per minute or > 140 per minute	• Pulse is too rapid or too slow causing chest pain, dizziness or fainting
IB18	Abnormal blood pressure	
	Systolic < 90 or > 200 m Hg; and/or	• Blood pressure rises too high or falls too low
	Diastolic < 60 or > 120 mmHg	
IB19	Acute confusional state[28], coma, or unresponsiveness *[EU AEP does not include confusional state, and specifies sudden onset]*	• Seizures *[may need to provide more detailed criteria]* • Fainting or loss of consciousness or disorder of consciousness *[may need to specify severity, especially for fainting]* • Head or spinal injury *[May need to assess severity]* • Sudden disturbance of cognition *[may need to specify more details]* • Change in mental state (abnormal behavior, confusion, difficult to wake) • Disorder in awareness: drowsiness, confusion, acute coma *[May need to be more specific]*. • Acute memory disturbance • Speech disturbance, difficulty or inability to speak

[27] Dehiscence means a surgical complication where the edges of a wound no longer meet and evisceration means disembowelment.

[28] Definition of confusional state, coma, unresponsiveness score (see Glasgow coma score for more concrete definitions)

I. Admission Criteria in AEP		Vietnamese criteria
		• Acute psychosis, have suicidal thoughts or behavior, want to kill.
IB20	ECG evidence of acute ischemia, must be suspicion of new myocardial infarction	• Chest pain *[May need to distinguish specific diagnosis, e.g. avoid admitting heart burn cases]*

The proposed Vietnamese emergency admission criteria also include sets of specialty-specific admission criteria. These more detailed sets of criteria reflect the understanding that the admission decision is complex and varies by medical condition and specialty. While fainting may not generally be a criteria for admission, when it occurs in a patient who has suffered from significant loss of blood it would likely require transfusion and call for hospital admission. From the draft policy document, it is not clear whether the proposed sets of specialist criteria are based on international scales, scores, protocols or instruments that have been validated for use in the Vietnamese context since no citations were provided. Examples of instruments and scores used in other countries are listed in Annex B.

Vietnamese Traditional medicine admissions criteria

Traditional medicine facilities and departments within general hospitals have a wide range of patients, including acute care, sub-acute care such as rehabilitation (e.g. after stroke), chronic pain and palliative care (e.g. during or after cancer treatment), and other chronic and often uncurable diseases (like liver disorders). These facilities have both inpatient, day and outpatient cases. In Vietnam, day cases in traditional medicine are those where the same intervention lasting 4 or more hours per day is repeated over multiple days and does not require an overnight stay (01/2019/TT-BYT). The Traditional Medicine Administration is proposing a separate policy on admission criteria for traditional medicine cases, which would cover emergency and non-emergency cases. These criteria are examined in Table 7 to understand the extent to which they overlap with the emergency admission criteria.

There are many similarities between the Traditional medicine and emergency admission criteria. In both draft policy documents, the ultimate decision for admission is to be made by a doctor and depends on the health and disease status of the patient. Criteria related to medical emergencies in traditional medicine have an obvious overlap with emergency admission criteria. However, the criteria proposed for traditional medicine lack specificity, making it difficult to distinguish which patients require overnight inpatient care, day care or outpatient care. Much traditional medicine care is sub-acute care, but admission criteria specific to sub-acute and acute care are not mentioned.

Table 7: Proposed traditional medicine admission criteria

Traditional medicine admission criteria	Overlap with emergency admission criteria?
Patient is in an emergency situation	Covered in emergency admission criteria
Patient is in an acute episode or emergency episode of a chronic disease.	Clinical criteria of an acute episode requiring admission versus those not requiring admission are not clearly defined.
Patient being treated on an outpatient or day basis and the pathology becomes more severe.	Clinical criteria requiring admission are not clearly defined
The primary disease is minor, but the patient has many comorbidities that require control or clinical management	Clinical criteria related to comorbidities that require admission are not clearly defined
The patient requires monitoring, assessment or diagnosis and clinical management	The criteria do not distinguish clearly whether this care could be provided on an outpatient basis
The patient needs daily assessment of their status, changes in condition and effectiveness of treatment	This corresponds generally to some clinical intensity criteria in the AEP, but could be more explicit.

Traditional medicine admission criteria	Overlap with emergency admission criteria?
The patient requires implementing technical interventions or medicines and those interventions or medicines cannot be implemented while an outpatient or a day patient.	A concrete list of technical interventions should be created to distinguish those requiring inpatient versus outpatient care.
The patient has a minor pathology/early phase of illness but their home is far or the patient does not have any relatives to provide care	This is an underlying reason for inappropriate admission but does not constitute a clinical criteria.
The patient has a minor pathology/moderate phase of illness but has complications	Clinical criteria related to complications that require admission are not clearly defined

Recommendations for Vietnam

Governance

1. Implement a thorough review of the existing legal basis for a policy on admissions decision-making, including the Law on Examination and Treatment, general hospital regulations, regulations on recording patient records and existing diagnosis and treatment guidelines for specific diseases.[29]

2. Consult with clinicians, claims reviewers, MOH departments and VSS to ensure that policies defining clinical criteria for admission or discharge and how those criteria will be used reflect the practical perspectives of multiple stakeholders.

Scope of policy and defining types of care

3**. For policy purposes, define hospital admission** more explicitly, for example requiring that admission involves an overnight stay or that a clear treatment plan including discharge criteria be required for all admissions.

4. **Define clearly the different types of admitted care (versus non-admitted care), their purpose and characteristics of patients eligible for different types of care in relation to provider payments**. Currently there is admitted care, day admission and outpatient care. However in-between types of admitted care are not yet clear, such as observation, day surgeries or sub-acute care (palliative care and rehabilitation). It would also be useful to clarify the policies and definitions of "noi tru ban ngay" care. When there is greater clarity on these different case types, it may be easier to develop appropriate admission criteria.

5. Expand the scope of the proposed admission criteria for medical emergencies to cover other admission types such as elective surgery. Acute care admissions include surgical as well as medical, some of which may be admitted through an emergency room (e.g. emergency surgery), while others may be admitted through referrals or the outpatient clinic (e.g. elective surgery).

6. Define the distinction between acute care and sub-acute care (palliative care, rehabilitation care) then stipulate distinct admission criteria for sub-acute care, which may be substantially different from acute care admission criteria.

7. While traditional medicine criteria are being proposed as a separate policy, consider integrating those criteria into a general policy of admission criteria for acute and sub-acute case types.

8. For emergency care, if it is not yet part of the system, consider developing triage criteria for assessing urgency of emergency interventions as a separate policy from admissions criteria because the decision to urgently treat an emergency case is a separate decision from the decision to admit a

[29] (quy che benh vien Decision **1895/1997/QĐ-BYT**, **Quyết định số số 4069/2001/QĐ-BYT on patient records)**

patient for specialty care and many emergencies can be resolved quickly in the emergency department without necessarily requiring an admission to a specialist ward.

Clinical criteria

9. Consider expanding the scope of policy to not only cover admission criteria, but also discharge criteria (or alternatively criteria for justifying an additional day of inpatient care).

10. If elective surgeries are included in the scope of the policy, **classify procedures into admitted versus non-admitted procedure types**. (The World Bank is preparing a separate technical report guiding analysis of ambulatory surgery policy based on international experience. Develop additional criteria to distinguish some patients who may need to be admitted for procedures generally considered non-admitted cases, such as patients with co-morbidities requiring further interventions after the procedure.

11. Consider also standardizing the bundling of pre-surgical and post-surgical visits, paraclinical services and related costs into the actual elective surgery admission, because these may be separated by several days or even weeks.

12. Review existing clinical guidelines (diagnosis and treatment guidelines) in collaboration with qualified clinicians and add objective and locally validated clinical admission criteria (scores, scales, protocols, instruments...) into the clinical guidelines for specific medical conditions in different specialties. Many hospitals may already be applying specialty specific criteria and their experience can inform this process.

13. Review the current lists of admission criteria proposed in the Vietnamese policy compared to the AEP list for suggestions to refine the Vietnamese list. Consider validation of the Vietnamese admissions criteria as is done in the international literature on AEP, and ensure that practicing clinicians are involved in this process.

Using clinical criteria for evaluating appropriateness of admission and discharge

14. Specify concretely the documentation doctors must provide to justify admission and additional length of stay. Patient documentation includes patient paper or electronic records as well as documents submitted for health insurance claims review. The justification for admission should explicitly explain why the patient could not be treated on an outpatient basis using clinical criteria such as those in the AEP or more specialist scores and protocols. The justification for admission can also provide reasons why the admission decision is made in cases that do not meet clinical criteria. To the extent possible incorporate documentation of justification for admission into the regulations on inpatient records and revisions of Circular 4210 to ensure that the information is available for claims reviewers of VSS as well as for MOH regular monitoring of quality of care.

15. Develop monitoring indicators and regular assessments of appropriateness of admission and hospital admission statistics reports to monitor over time and benchmark hospitals. The MOH and VSS will need to collaborate in developing these criteria and in setting up the policies that use these criteria as part of claims review, including what happens when hospitals admit too many patients who don't meet the criteria.

Additional references

Hospital services

Australian Institute of Health and Welfare 2017. Variation in hospital admission policies and practices: Australian hospital statistics. Health services series no. 79. Cat. no. HSE 193. Canberra: AIHW. https://www.aihw.gov.au/reports/hospitals/variation-hospital-admission-policies-practices/contents/table-of-contents

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NHS 2020. Hospital Admitted Patient Care Activity 2019-20. https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2019-20

Rehabilitation services

https://www.gwhospital.com/conditions-services/rehabilitation-services/admission-discharge-criteria

Annex A: Day of care criteria from AEP in EU and the US

II. Day of care criteria	
IIA	**Medical services**
IIA1	Procedure in operating room that day (i.e. the day reviewed)
IIA2	Scheduled for procedure in operating room the next day requiring extraordinary preoperative consultation or evaluation
IIA3	Cardiac catheterization that day
IIA4	Angiography that day
IIA5	Biopsy of internal organ that day
IIA6	Invasive central nervous system diagnosis procedure that day
IIA7	Any test requiring strict dietary control, for the duration of the diet *[EU does not limit to duration of diet]*
IIA8	New or experimental treatment requiring frequent dose adjustments under direct medical supervision *[EU does not limit to new or experimental treatment]*
IIA9	Condition requiring close medical monitoring by a doctor at least three times daily
IIA10	Major invasive procedure within the past 24 hours *[EU specifies postoperative day after operating room procedure or procedures 3-6 above]*
IIB	**Nursing/life support service**
IIB11	Respiratory care: intermittent or continuous respirator use and/or inhalation therapy *[EU specifies at least 3 times per day]*
IIB12	Parenteral therapy: intermittent or continuous IV fluid with any supplementation[30]
IIB13	Continuous monitoring of vital signs, at least every 30 minutes for at least 4 hours
IIB14	Intramuscular and subcutaneous injections at least twice daily *[EU AEP does not have this item]*
IIB15	Intake and output (i.e. urine) measurements *[EU AEP calls this fluid balance]*
IIB16	Major surgical wound and drainage care
IIB17	Close medical monitoring by a nurse at least three times daily under physician's orders
IIC	**Patient condition**
IIC18	Inability to void or move bowels (past 24 hours) not attributable to underlying neurological disorder *[EU AEP does not exclude neurological disorder]*
IIC19	Transfusion due to blood loss *[EU AEP specifies in past 48 hours]*
IIC20	Ventricular fibrillation or ECG evidence of acute ischemia, as stated in progress note or in ECG report *[EU APE specifies in last 48 hours]*
IIC21	Fever of at least 38.3° C rectally (or at least 37.8° C orally) if the patient was admitted for reason other than fever *[EU AEP specifies fever 38 °C]*
IIC22	Coma: unresponsiveness for at least 1 hour *[EU specifies in the past 48 hours]*
IIC23	Acute confusional state, not due to alcohol withdrawal *[EU AEP specifies in last 48 hours]*
IIC24	Acute hematological disorders, significant neutropenia, anemia, thrombocytopenia, leukocytosis, erythrocytosis, or thrombocytosis yielding signs or symptoms
IIC25	Progressive acute neurological difficulties *[EU AEP specifies in past 48 hours]*

Source: Lang, Thierry, Alessandro Liberati, Antonio Tampieri, Guido Fellin, M. L. N. L. Gonsalves, Susana Lorenzo, Maggie Pearson, Roger Beech, and B. Santos-Eggiman. "A European version of the appropriateness evaluation protocol." *International journal of technology assessment in health care* 15, no. 1 (1999): 185-97.

[30] Supplementation means that a drug is supplied

Annex B: Specialist admission criteria from the international literature

Vietnamese draft protocol category	**International protocol examples**
Dehydration	Clinical Dehydration Scale (CDS)[31] WHO Scale Gorelick Scale
Seizures	Distinguishing epileptic from non-epileptic seizures[32,33]
Vomiting (included in dehydration)	See dehydration or electrolyte imbalance criteria.
Wounds	No scores on wounds were found, but many on injury and trauma: Injury Severity Score (ISS) is an established medical score to assess trauma severity Malawi Trauma Score[34] Revised Trauma Score and Injury Severity Score[35]
Muscle and bone conditions	
Acute heart conditions	Grace acute coronary syndrome (ACS) score[36] The New York Heart Association (NYHA) Classification of heart failure.[37] Pulmonary embolism severity index (PESI)[38]
Acute neurological and psychological conditions -Suicide	San Francisco Syncope scores[39] For suicide: [40] Manchester self-harm project, Implicit Associations Test Violence and Suicide Assessment Form
Endocrinology conditions	Hyperglycemia risk[41]

[31]Falszewska, Anna, Hania Szajewska, and Piotr Dziechciarz. "Diagnostic accuracy of three clinical dehydration scales: a systematic review." Archives of disease in childhood 103, no. 4 (2018): 383-388.

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[33] https://www.acepnow.com/article/best-practices-seizure-management-emergency-department/?singlepage=1&theme=print-friendly

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[40] Randall, Jason R., Ian Colman, and Brian H. Rowe. "A systematic review of psychometric assessment of self-harm risk in the emergency department." *Journal of affective disorders* 134, no. 1-3 (2011): 348-355.

Vietnamese draft protocol category	**International protocol examples**
Digestive system conditions	Blatchford instrument for acute upper GI bleed[42]
Oncology	
Respiratory system conditions	CURB 65[43] protocol for community acquired pneumonia
Obstetric/gynecologic conditions	EmOC[44,45]
Skin and connective tissue conditions	
Urinary and kidney system conditions	Renal colic, urolithiasis (kidney and other urinary tract stones)[46]
Stroke[47]	Face Arm Speech Test (FAST) Recognition of Stroke in the Emergency Room (ROSIER) Los Angeles Prehospital Stroke Screen (LAPSS) Melbourne Ambulance Stroke Scale (MASS) Ontario Prehospital Stroke Screening tool (OPSS) Medic Prehospital Assessment for Code Stroke (MedPACS) Cincinnati Prehospital Stroke Scale (CPSS)
Hematology conditions	
Rehabilitation/physical therapy	Q-admissions, frailty scores
Others:	
	Shock index[48]
	Nonspecific complaint (NSC)[49]

[41] Siddiqi, Lubna, Kristine VanAarsen, Alla Iansavichene, and Justin Yan. "Risk factors for adverse outcomes in adult and pediatric patients with hyperglycemia presenting to the emergency department: a systematic review." Canadian journal of diabetes 43, no. 5 (2019): 361-369.

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Annex C: Claims review data analysis of admission characteristics

It may be useful to define some additional categories for analyzing hospital admissions. We propose starting by analyzing frequency of the different categories in Table C1 and C2. Table C1 aims to analyze the modality of admission. The decision-making criteria in different modalities may need to be defined in different ways, so it is good to understand the overall structure of different modalities of admission. This could later be analyzed by type of hospital or region, or even by age of patient.

Table C 1: Frequency of admission by reason for admission (Vnese) and modality of admission (unit: number (%) of admissions)

	Vietnam's current criteria (MA_LYDO_VVIEN)			
Modality of admission	Correct level of care 1. Đúng tuyến	Emergency care 2. Cấp cứu	Incorrect level of care 3. Trái tuyến	Incorrect level but now allowed 4. Thông tuyến
Nhập do chuyển tuyến (referral from other hospital)				
Nhập qua phòng cấp cứu không phẫu thuật cấp cứu (Emergency department)				
PT cấp cứu				
Nhập qua phòng khám ngoại trú (outpatient clinic referral)				
Phẫu thuật theo kế hoạch (elective surgery)				
Thủ thuật theo kế hoạch (elective procedure)				

Definitions using dữ liệu 4210 và mã tương đương

	modality of admission	Other criteria on modality	Surgical criteria	Day of admission criteria	Exclusion
1	Transfer	MA_NOI_CHUYEN is not missing. MA_LOAI_KCB=2 (inpatient)			MA_NOI_CHUYEN is missing
2	Emergency	MA_LOAI_KCB=2 (inpatient) MA_KHOA = K02 for any service on NGAY_VAO		NGAY_YL for bed is same day as NGAY_VAO	Not transfer
3	Emergency surgery (within 24 hours of admission)	MA_LOAI_KCB=2(inpatient) Not limited to cases passing through	MA_DICH_VU is on list of mã tương đương where phân loại	NGAY_VAO -NGAY_YL for any PT<24	Not transfer

	modality of admission	Other criteria on modality	Surgical criteria	Day of admission criteria	Exclusion
		emergency department MA_KHOA=K02	PTTT= PD, P1, P2, P3, P4.	HOURS.	
4	Outpatient department (non-surgical and non-transfer)	MA_LOAI_KCB=2 (inpatient) MA_KHOA=K01 for any service on NGAY_VAO	Mã dịch vụ does not include PTTT=PD, P1, P2, P3, P4, TD, T1, T2, T3, T4		Not transfer, not emergency, not emergency surgery
5	Elective surgery (defined as surgery >=24 hours after first contact with facility	MA_LOAI_KCB=2(inpatient)	MA_DICH_VU is on list of mã tương đương where phân loại PTTT indicates PD, P1, P2, P3, P4.	NGAY_VAO -NGAY_YL for any PT>=24 HOURS	Not transfer, not emergency, not emergency surgery.
6	Non-emergency procedure	MA_LOAI_KCB=2(inpatient)	MA_DICH_VU is on list with phân loại PTTT as TD, T1, T2, T3, T4		Not transfer, not emergency,not emergency surgery and not elective surgery.

The length of stay could be analyzed to begin considering a policy on day surgery (PT ban ngày). It may also be useful to examine the case types with length of stay longer than 2 weeks or longer than 1 month to contribute towards defining sub-acute care and admission criteria and length of stay criteria for sub-acute care, which appears to be common in traditional medicine or rehabilitation services.

Table C 2: Frequency of admission by length of stay and modality of admission (unit: number (%) of admissions)

	Length of admission				
Purpose of admission	< 24 hours	24 hours to < 48 hours	48 hours to <14 days	14 days to < 31 days	31 days and more
Surgery (PT)					
Procedure (TT) (no surgery)					
Internal medicine (excl. trad. Medicine and PHCN)					
Traditional medicine (excl. surgery)					
PHCN (excl. surgery)					

Definitions using dữ liệu 4210 và mã tương đương

Length of stay is defined based on total bed days charged. This is defined by MA_DICHVU indicating type of bed, and NGAY_YL and NGAY_KQ

Category	Definition using 4210
Surgery	Ma_dichvu has PTTT loại PD, P1, P2, P3, P4
Procedure	Not Surgery and Ma_dichvu has PTTT loại TD, T1, T2, T3, T4.
Internal medicine (Nội khoa)	Not surgery and not procedure.
Traditional medicine (YHCT)	Treated in BV YHCT or in ma khoa=K16. Excludes surgical and procedure cases.
Rehabilitation (PHCN)	Treated in BV PHCN or in Ma khoa=K31.
Alternative ways to define TM and PHCN services	
Option 1: Define Traditional medicine and PHCN if any bed days in khoa K16 or K31.	
Option 2: Define Traditional medicine and PHCN if all bed days in khoa K16 or K31.	