

Annotation Guidelines for Incident Reports of Medication Errors (Japanese Reports)

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1 INTRODUCTION

These are the guidelines for annotating incident reports of medication errors. The ultimate goal of these guidelines is to improve patient safety. To do so, these guidelines establish a framework for retrieving information from incident reports. This document aims to instruct others on how to manually annotate incident reports for the creation of training or gold standard data for automated annotation. Using recent advances in named entity recognition (NER) and artificial intelligence (AI) [1], our study provides a framework for annotating the information in incident reports in a way that allows medication errors to be extracted automatically. We envision that the entire approach could revolutionise the way we collect, utilise, and retrieve information from incident reports.

These guidelines demonstrate how to extract explicit properties of medication errors, organise abstract incident information into meaningful entities associated with incident reporting and illustrate the methods for annotating named entities of interest in incident reports. This report begins with an introduction to the various named entities (hereafter NEs, also called concepts) with examples of how they can be annotated. Each NE is associated with certain characteristics; these are presented as attributes. These guidelines provide plenty of examples of how to apply the correct attribute to the correct NE. Certain combinations of annotation tags within an incident can be interpreted systematically; these are presented as incident types and are grouped into processes of care. We also illustrate situation-specific methods of annotation with several examples.

This study was developed based on a rich body of literature. Using state-of-the-art incident reporting guidelines, we conducted an extensive narrative review of medication errors, classification schemes and annotation methods (as shown in Figure 1). Literature from the WHO International Classification of Patient Safety [2], WHO Minimal Information Model for Patient Safety (MIMPS) [3], National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) [4], Agency for Health Research and Quality (AHRQ) Common Formats Version 2.0 [5] and European Medicines Agency Good Practice Guide [6], as well as other relevant studies [4, 5, 7-10], were carefully reviewed, referenced and synthesised. We also referred to guidelines for the development of a classification scheme suitable for information extraction in general [11, 12] and clinical contexts [13, 14].

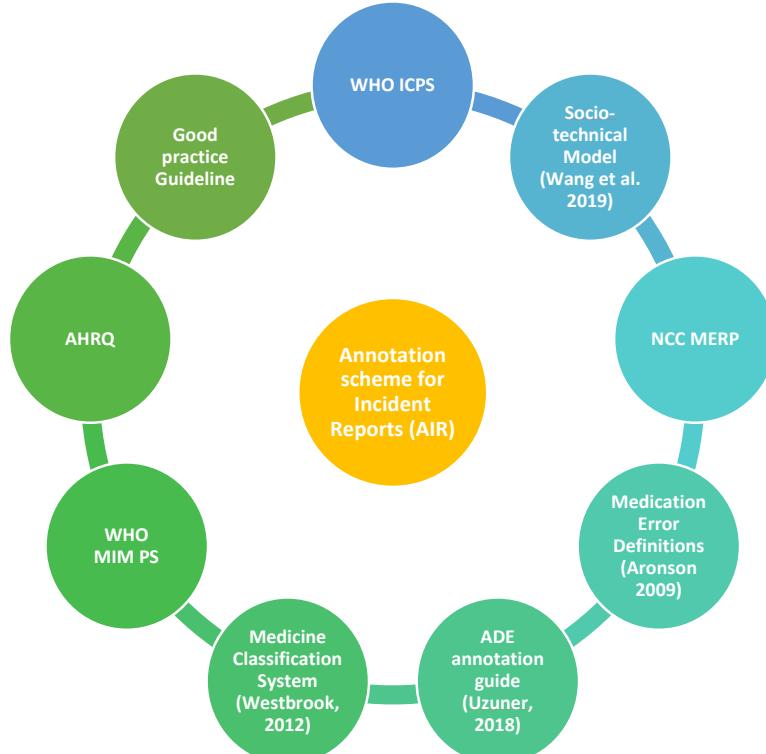


Figure 1. Literature review on annotation.

In these guidelines, we first explain the details of the annotation procedure (Chapter 2). How to annotate named entities is presented in Chapter 3 and attributes are presented in Chapter 4. Chapter 5 describes how to identify incident types based on the annotated medication errors. Throughout these guidelines, we provide sample incident reports to illustrate how to annotate named entities that are likely to be found in the narrative text of incident reports.

2 THE ANNOTATION TASK

2.1 GENERAL

The annotation procedure aims to extract a set of NEs from incident reports and identify their associated properties. The task consists of three subtasks:

- Identifying NEs, as described in Chapter 3.
- Applying attributes to specify the type and properties of each NE that has been annotated (details are provided in Chapter 4).
- Interpreting the incident type of each incident report by analysing the identified NEs and their attributes (details are provided in Chapter 5).

2.2 RATIONALE

Several basic philosophies, principles and rules apply to the annotation procedure. They are as follows:

- Annotating based on content. Annotation is based on only what is written in the incident report. Nothing should be left to the annotator's interpretation or imagination regarding incident progression. One notable exception is that misspellings are annotated as their intended entity, so long as the intended meaning is obvious from the context.
- Annotating when it fits. It is essential to follow the methods detailed in the annotation guidelines to ensure NEs are annotated appropriately. If in doubt, annotation is not done.
- Annotating everything applicable. In order to ensure the optimal prediction outcome, all NEs should be annotated, whether they correspond to medication errors or not.
- Annotating repeated items. Sometimes terminology that can be tagged as an NE is used repeatedly. As long as there is no difference in text properties, we annotate all repeated items the same way.
- Annotating only some aspects of speech. Only nouns are annotated, not verbs or adverbs.
- Acknowledging that quality and style of writing varies across authors.
- Balancing annotation complexity and patient safety impact. We have designed these annotation guidelines to be as simple as possible while still being capable of distinguishing between a variety of incident types. Simpler and more intuitive annotation rules minimise annotation errors.

2.3 THE ANNOTATION TOOL 'BRAT'

Annotation can be carried out using software such as BRAT, Oxygen XML, Prodigy and Doccano. In these annotation guidelines, we use BRAT: the 'brat rapid annotation tool' (<http://brat.nlplab.org>); all annotation examples are demonstrated with this platform. BRAT is a web-based tool for text annotation; that is, for adding notes to an existing text document. Two types of annotation can be done on BRAT: text-span annotation and relation annotation. Additionally, attributes can be applied to each annotation, which allows labelling of specific characteristics belonging to a group or individual. The BRAT manual can be accessed here: <http://brat.nlplab.org/manual.html>; the BRAT interface is shown in Figure 2.



Figure 2. A screenshot of Brat.

2.4 A NOTE ON WHAT KIND OF LANGUAGE IS CONSIDERED

The current state of NER can only capture variables of nouns, proper nouns, compound nouns and numbers. The nominalisation of verbs, adjectives and adverbs is not considered in this annotation scheme. Examples of how words are categorised follow:

- Common nouns: antibiotics, sedative, doctor, etc.
- Proper nouns: Penicillin, Patient A, Diazepam, etc.
- Numerals: 50, 1/2, 16:00, etc.
- Compound nouns: pain killer, food poisoning, etc.

Terms that are embedded within an inappropriate string of text are not annotated. For example, '38203, warfarin bag' is not annotated as the NE 'drug' (for warfarin).

2.5 MARKING THE RELEVANT SPAN OF TEXT

After the information to be extracted has been identified, the next step in the annotation process is to mark the span of text needed to correctly register the variable. In general, text spans should be as short as possible and marked consistently. Some examples follow.

Table 1. Examples of relevant spans of text.

Example Text	Correct text span	Incorrect text span
doctor prescribed diltiazem instead of diazepam	doctor prescribed <u>diltiazem</u> instead of <u>diazepam</u> <i>Explanation: each drug name should be tagged separately in a minimal span.</i>	doctor prescribed <u>diltiazem</u> instead of <u>diazepam</u> doctor prescribed <u>diltiazem</u> instead of <u>diazepam</u>
pharmacist dispensed a 5-mg prednisone tablet instead of a 1-mg prednisone tablet	pharmacist dispensed a 5-mg prednisone tablet instead of a 1-mg prednisone tablet <i>Explanation: different NEs should be tagged separately even these are corresponding to the same event.</i>	pharmacist dispensed a 5-mg prednisone tablet instead of a 1-mg prednisone tablet pharmacist dispensed a 5-mg prednisone tablet instead of a 1-mg prednisone tablet
nurse forgot to give oxycodone to patient at 8 am. After discovery, the nurse administrated oxycodone at 11 am	nurse forgot to give oxycodone to patient at 8 am. After discovery, the nurse administrated oxycodone at 11 am. <i>Explanation: numbers and units should be tagged together.</i>	nurse forgot to give oxycodone to patient at 8 am. After discovery, the nurse administrated oxycodone at 11 am. nurse forgot to give oxycodone to patient at 8 am. After discovery, the nurse administrated oxycodone at 11 am.

3 NAMED ENTITIES

This chapter provides practical guidelines for identifying NEs in incident reports. For illustrative purposes, some examples are provided in English. Most examples, however, use actual, Japanese-language incident reports.

3.1 DRUG

This type of NE is selected to specify the drug. All recognised drug names should be identified in the report.

Example 1:

[◀](#) [▶](#) /txt_format/Pilot_sample_30cases/39470

1 [[事故の内容]]

2 1 7時頃、病棟看護師よりセファメジン α 静注用1gを実施のところセフメタゾン静注用1gを実施したとの連絡が入り、
Drug * Form form Strength_amount Drug * Form form Strength_amount

3 払い出しの際にセフメタゾンを調剤してしまったことが判明した。
Drug *

4 調剤時は多忙であったため、注射調剤担当の事務員が取り揃えた薬剤を薬剤師が1名で調剤・監査しており、間違いに気がつかなかった。

5 また、看護補助の受け取り、看護師による投与の際にも間違いが発見されず、
Drug * Frequency Strength_amount

6 1日2回の用法のうち1回目をセフメタゾン1gで患者に投与したことを見たことを担当看護師より説明を受けた。

7 発見後は直ちに病棟にて事実確認と謝罪を行い、2回目の薬剤を正しいものと交換した。

Example 1 illustrates how different drugs are typically tagged. Cefamezina is the drug intended for delivery but the drug that was actually prescribed is Cefmetazon. In this case, both are recognised as NEs.

Example 2: *Normal Saline* was stopped when *Red Blood Cell (RBC)* was given to the patient.

Incident reports related to blood products are not the target of this classification scheme. However, blood products should be annotated as a drug if they are involved in an incident. Thus, in Example 2, Red Blood Cell (RBC) is annotated, despite not being the main drug associated with the error. Enteral nutrients can also be prescribed as drugs. Drug names and drug family names that are listed on lists of common medication should be regarded as drug NEs. Both product names and generic names should be annotated.

Example 3:

[◀](#) [▶](#) /txt_format/Pilot_sample_30cases/10748

1 [[事故の内容]]

2 17時準夜勤点滴確認にて夜間抗生剤投与できていないことを発見する。
Drug *

3 指示簿には抗生剤投与時間記載あったが、点滴には時間指示がなかった。
Drug *

4 整形外科医師へ報告し、点滴処方で終了指示あり。

6 [[事故の背景要因の概要]]

7 点滴の時間指示が入っていないかった。指示簿には記載しているが見落としてしまった。

9 [[改善策]]

10 指示簿の確認を確実に実施する。主治医へ点滴時間指示を入れてもらえるように依頼する。指示簿だけでなく、掲示板にも抗生剤時間を記載する。

In incident reports, classes of drugs (e.g., antibiotics, maintenance fluids, total parenteral nutrition), types of medication (e.g., oral medication) or medication for specific situations (e.g., daily medication, discharge prescriptions) are sometimes annotated as a drug NE. While this is acceptable, we need to indicate the properties of the drug by applying attributes. For details on attributes, please refer to Chapter 4.2.1. In Example 3, 'Antibiotics' is annotated, which describes the class of the drug, the specific drug name is absent in the report.

Example 4: Oral medication before breakfast was missed.

Sometimes the names of drugs are left unspecified. In Example 4, a drug name is not specified; the drug is identified simply as oral medication instead.

Example 5:

/txt_format/Pilot_sample_30cases/17607

- | | |
|----|--|
| 1 | [[[事故の内容]]] |
| | Drug * |
| 2 | 朝食後の内服を服用しなかった。 |
| 4 | [[[事故の背景要因の概要]]] |
| 5 | ・BOX管理（看護師が患者に渡して患者が1日分セットする）。 |
| 6 | ・起床時に服用する薬剤のことが気になっており、朝食後に服用することを忘れてしまった。 |
| 7 | ・昼に患者がBOXに準備する時に薬剤を持参して気が付いた。 |
| 9 | [[[改善策]]] |
| 10 | ・服薬指導。・服薬確認。 |

Similar to Example 4, no specific drug name is given.

Example 6:

/txt_format/Pilot_sample_30cases/31926

- | | |
|---|---|
| 1 | [[[事故の内容]]] |
| | Drug * |
| 2 | 18時にデュロテップパッチの貼り替え指示があつたが、指示を見落とし、貼り替え忘れた。 |
| | Drug * |
| 3 | 2日後12:30頃ラウンドした日勤看護師がデュロテップパッチを貼り替えていないことに気づいた。 |
| 5 | [[[事故の背景要因の概要]]] |
| 6 | 不明 |
| 8 | [[[改善策]]] |
| 9 | 不明 |

Patches are also annotated as drugs.

When unspecified, drugs are typically described using the terms below. Common classes of drug are also listed.

Unspecified drug
薬剤、内服、内用薬、注射薬、外用薬、静注薬、点滴、定期薬、退院時処方、吸入薬、外用塗布薬、点眼薬、点鼻薬、前投薬 etc

Drug classes
抗生素、解熱剤、鎮痛・消炎薬、精神・神経用薬、アレルギー薬、呼吸器疾患治療薬、糖尿病治療薬、電解質製剤、輸液製剤等

When the drug name is uncertain, refer to the complete list of Japanese drug names:

<https://www.mhlw.go.jp/topics/2018/04/tp20180401-01.html>. If the variable closely resembles a drug name but the exact name cannot be found in the list, or the spelling is different or wrong, the variable should still be annotated as a drug. However, the drug would be characterised as 'uncertain' using attributes (for details, please refer to Chapter 4.2.1).

What else should be known about drug names?

NEs such as drug, strength, form, timing, duration, frequency, dosage and route mainly contain sequences of nouns, compound nouns and numbers. Sometimes the official commercial name of a drug contains information about form and strength. These need to be annotated separately as their corresponding NEs. Incident reporters may refer to a drug in different ways. Such variations are still considered as the same drug and therefore share the same relation number (refer to the attributes part of Chapter 4.1). Examples of the various ways drug names might be reported are shown below.

Ways the drug might appear in incident reports	Corresponding annotation method (see Chapter 0)
Warfarin	
ワーファリン	ワーファリン[NE: drug]
ワーファリン錠	ワーファリン[NE: drug] 錠[NE: form]
ワーファリン5mg錠	ワーファリン[NE: drug] 5mg[NE: strength-amount]錠[NE: form]
Precedex	
プレセデックス	プレセデックス[NE: drug]
プレセデックス静注液	プレセデックス[NE: drug] 静注液[NE: form]
プレセデックス静注液200 μg	プレセデックス[NE: drug] 静注液[NE: form] 200 μg[NE: strength – amount]
プレセデックス静注液200 μg/2ml	プレセデックス[NE: drug] 静注液[NE: form] 200 μg/2ml[NE: strength – concentration]
プレセデックス静注液200 μg[マルイシ][200 μg/2ml]	プレセデックス[NE: drug] 静注液[NE: form] 200 μg[NE: strength] [マルイシ]*[200 μg/2ml[NE: strength – concentration]]

3.2 FORM

This entity type should be selected to specify the form of the drug or its mode of action.

3.2.1 FORM – FORM

Form is the physical form of the drug, such as a tablet.

3.2.2 FORM – MODE

The mode is the drug's mode of action, which is associated with its pharmacodynamic action. Consider the following example:

Sodium valproate was prescribed, but sodium valproate ER [extended release] was dispensed by the pharmacist.

Common types of form – mode, found in sublingual tablets, lozenges and enteric dissolving tablets, include the following:

- OD: Orally disintegrating
- D: Disintegrating
- RPD: Rapidly disintegrating
- RM: Rapidly melting, rapid dissolution
- ER: Extended release

It is important to be cautious of the differences between form – mode, form – form, dosage and route. These NEs can be misannotated if labelled based on the terms alone instead of the content of the whole incident report.

3.3 STRENGTH

Strength is the amount of drug associated with a particular dosage.

3.3.1 STRENGTH – AMOUNT

This type of NE specifies the amount of drug per unit. Note that if the number of units are described as a total dose per day, this is categorised as strength – amount.

Example 7: A doctor ordered vancomycin 500 mg diluted in 100 ml normal saline, but the nurse used vancomycin 500 mg diluted in 10 ml normal saline.

Error! Reference source not found. demonstrates how amounts of drug are typically described. 500 mg, 100 ml and 10 ml are all grouped as strength – amount.

Typically, strength – amount is presented as amount per unit, as shown above. However, the amount presented in the incident report can sometimes be in the form of amount per consumption (a one-time dose), total amount per day (or other unit of frequency, e.g., week) or total amount for the whole course of medication. All of these cases would be registered as the NE strength – amount, but such properties are registered as entity-specific attributes (see Chapter 4.2.2)

3.3.2 STRENGTH – RATE

This entity type should be selected to specify the speed with which a drug is administered. Strength – rate is typically represented with one measure compared to another measure. For instance, the flow rate of solution is represented as millilitres per hour.

Example 8: Soldem3A 200 ml was set on a pump and started at 100 ml/hr.

Note that in Example 8, ‘200 ml’ is not categorised as strength – amount because ‘100 ml/hr’ indicates a rate; this example is categorised as strength – rate instead.

Example 9: A doctor ordered a change in the rate of fentanyl to 0.5 ml/hr but the nurse missed the order.

In Example 9, 0.5 ml/hr is the flow rate of fentanyl and it should be grouped as NE strength – rate.

3.3.3 STRENGTH – CONCENTRATION

This entity type should be selected to specify the relative amount of a substance within a solution or mixture. This NE can be applied to existing drugs or mixtures.

Example 10: 20% glucose was injected.

Example 10 demonstrates strength – concentration as a percentage: 20% glucose.

3.4 DURATION

This entity type should be selected to specify the period for which a drug is administered to the patient. If the unit is in days, we can annotate either the number or the number and the days. We annotate other durations described in the incident report using the relation attribute, which is described in Chapter 4.1.2. E.g., if the patient is supposed to revisit the facility in seven days, then ‘seven days’ is tagged as the duration NE. However, it would be indexed as whichever relation number is remaining.

Duration can sometimes be presented in hours or minutes when referring to how long it takes to deliver medication. This information is also registered under the duration attribute.

Example 11: A doctor ordered the administration of 100 units/kg intravenous heparin sodium injection for the treatment of deep vein thrombosis for 7 days.

Example 12: 14 days’ worth of inhalants were finished within 5 days.

In Example 11 and Example 12, either the number alone or the number and the day can be tagged because the unit of duration is days. Most incident reports use days as the unit of duration.

日数	件数	日数	件数
14日分	29	x14days	1
14TD	8	g14TM	1
14T	5	g14TH	1
/14T	5	D14T	1
14日	4 (14)		1
× 14日分	4	14N	1
(14)	4	14/T	1
/14TD	3	× 14TD	1
X14日分	2	× (14)	1
g14TD	2	/14ds	1
× 14T	3	/14	1
/14日分	2	空欄	1
x14日			1

Figure 3. Various ways to indicate an order for 14 days [31].

shows various descriptions for a duration of 14 days [31]. Under such circumstances, the unit is assumed to be days and only 14 can be annotated.

日数	件数	日数	件数
14日分	29	x14days	1
14TD	8	g14TM	1
14T	5	g14TH	1
/14T	5	D14T	1
14日	4 (14)		1
× 14日分	4	14N	1
(14)	4	14/T	1
/14TD	3	× 14TD	1
X14日分	2	× (14)	1
g14TD	2	/14ds	1
× 14T	3	/14	1
/14日分	2	空欄	1
x14日			1

Figure 3. Various ways to indicate an order for 14 days [31].

Example 13: A doctor prescribed antibiotics for 1 week.

Sometimes, a week, month or other unit of time is used to describe periods of drug administration. In these cases we annotate both the number and the unit, as seen in Example 13.

Example 14: 5 ml of antibiotics were injected into the patient over the course of 1 hour instead of 30 mins.

In this example, 5 ml is indicated as the NE strength – amount and we annotate both 30 minutes and 1 hour as the NE duration. By combining the NE strength – amount and the NE time, we know the strength – rate is 5 ml/30 minutes and 5 ml/1 hour. However, the report specifies a period of time and does not compare one measure against another. Therefore, 30 minutes and 1 hour are categorised as the NE duration.

3.5 TIMING

This type of entity is selected to specify the time at which a drug is given. Time is typically described as clock time or as a noun description, such as ‘before breakfast’, ‘lunch’, or ‘bedtime’. The time to administer a drug is sometimes not specified (e.g., only information related to frequency is given). In such cases, time is not annotated. The date is also treated as time.

Example 15: The nurse forgot to give oxycodone to a patient at 8 am. After discovery, the nurse administered oxycodone at 11 am.

In Example 15, clock time is used to describe at what moment the drug is or should be taken. Therefore, 8 am and 11 am are tagged as time.

Example 16:

/txt_format/Pilot_sample_30cases/6179

1	[[[事故の内容]]]
2	プロスタリンを日に与薬するのを忘れた。
3	指示簿の確認を忘れていた。昼は1剤のみ。
4	しっかり確認することが必要だと思った。準夜勤務者が見つけてくれて、教えてくれたので医師に確認しその時点で投与した。
6	[[[事故の背景要因の概要]]]
7	同室者がおらず、その病室はこの患者のみだった。病室ごと指示簿確認をしていない可能性。
9	[[[改善策]]]
10	確実な投薬の手順を守る。

In Example 16, a noun is used to indicate the time.

3.6 FREQUENCY

This entity type should be selected to specify the frequency at which a drug is given. Frequency is defined as how many times a drug is given per unit of time.

Example 17: A doctor ordered heparin calcium 3 times/day for the prevention of deep thrombosis after myoma operation. Nurse administered it 1 time/day.

In Example 17, 3 times/day and 1 time/day refer to how often the patient takes medicine; these are tagged as the NE frequency.

A study by the Ministry of Health, Labor and Welfare [31] has demonstrated common ways to describe taking a drug 3 times a day, as illustrated in **Error! Reference source not found..**

Table 3. Various prescription orders for taking a drug 3 times a day [31].

3xN	分 3
3x	分 x3 每食後
分 3 每食後	3 回:朝.昼.夕食後
3xndE	3x 朝、昼、夕食後
1 日 3 回 每食後	3x 各食後
分 3 后	3x 后
分 3 後	3x1 每食後
分 3 各食後	3? (unreadable)
3x 每食後	[分 3] 1 日 3 回 每食後
3x 食後	/每食後
3x1	/分 3 後
1 日 3 回 朝・昼・夕食後	/分 3 nde

/分 3 食後	/分 3
/3xnde	/Nx
/3xn	/N3x 1
/3x	/3 食後
每食後すぐ	/3x 每食後
分 3 每食後	/3nde
分 3: 朝昼夕食後 30 分	

3.7 DATE

This entity type is used to indicate any mentions of a specific time point that are at least one day in length, e.g., ‘the 7th’ or ‘Tuesday’.

3.8 DOSAGE

This entity type should be selected to specify a drug dosage. Dosage is defined as the number of units (e.g., tablets, bottles or ampules) given to the patient for a single consumption. If dosages are described in units, both the dosage and unit should be annotated. Information pertaining to form only, e.g., tablet, should not be annotated as dosage.

The relationship between NEs changes depending on how strength – amount is expressed. For example, if strength – amount is expressed in amount per unit, other NEs would be understood as follows:

- Dosage with strength – amount is equivalent to amount per consumption (i.e., a one-time dosage)
- Dosage with strength – amount with frequency (in days) is equivalent to the total amount per day
- Dosage with strength – amount with frequency (in days) with duration is equivalent to the total amount of medication taken throughout the course

However, if strength – amount is presented in per consumption, per day or per medication course, the above relationships would change accordingly.

According to the MEXT standard prescription guide, the amount per consumption is ideally prescribed by physicians. Annotators need to be aware that incident reports vary and the relationship between NEs may depend on the report.

Example 18: A doctor ordered 3 [dosage] *100 mg [strength – amount] aspirin [drug] tablets [form] 2 times/day [frequency], but the nurse gave 1 [dosage]* 100 mg [strength – amount] aspirin [drug] tablet [form].

In **Error! Reference source not found.**, dosages are described with a number and are annotated accordingly.

Example 19: A doctor ordered 1 tablet 2 times/day.

In Example 19, ‘1 tablet’ is annotated as the NE dosage, instead of ‘1’ being tagged as dosage and ‘tablet’ being tagged as form.

Example 20:

[◀](#) [▶](#) /txt_format/Pilot_sample_30cases/6817

1 [[事故の内容]]

 2 マグラックス錠 2 5 0 mg 3錠、レバミピド錠 3錠分 3 4日のところ、マグラックスのかわりにロキソニンを調剤し、
 3 鑑査も見落として払い出し、病棟看護師が間違いを発見した。再調剤を行い払い出した。患者には処方どおりに配薬した。

5 [[事故の背景要因の概要]]

 6 口噴から数多く、レバミピド+ロキソニンの処方を調剤しており、今回も同じであると思い込み、処方箋を正確に読まなかった。

8 [[改善策]]
 9 マニアリ通りに調剤、鑑査を行う。

In Example 20, ‘3’ would be tagged as the dosage and ‘four days’ would be treated as the duration.

3.9 ROUTE

This entity type is selected to specify the drug route. Route is defined as the way the drug is administered to the patient, including infusion sites, routes and pumps. Annotators may find it difficult to distinguish between form and route.

Example 21: Incremin syrup 5 ml was prepared for oral administration in a syringe but was administered by intravenous infusion.

In **Error! Reference source not found.**, oral and intravenous are the way the drug is administrated to the patient, i.e., route.

Example 22: Doctor ordered oral furosemide to be stopped but the nurse mistakenly stopped intravenous furosemide.

In **Error! Reference source not found.**, oral and intravenous are the way the drug is administrated, although one might interpret oral and intravenous as the form of furosemide. Under such occasions, we can annotate oral and intravenous as form or route.

Other examples of the NE route include:

- Cutaneous, topical application, including ointments, sprays and patches
- Subcutaneous
- Ophthalmic
- Oral, including sublingual or buccal
- Optic
- Nasal – spray type
- Inhalation
- Intravenous
- Intramuscular
- Intrathecal
- Epidural
- Gastric
- Rectal
- Vaginal
- Intra-arterial
- Intra-peritoneal
- Intra-osseous

3.10 WRONG PATIENT

This entity type involves two patients: one who received the dose by mistake and one who suffered from an omission error. This NE is used only when two different hospital subjects are involved. If the incident does not involve a mistake related to patient identity, we do not annotate any patient identities within the incident report (unlike other NEs). If the incident involves a mistake related to patient identity, we annotate all patient identities within the incident report. In most cases, identifiers of the patients involved (e.g., name, ID, etc.) are de-identified before annotation or analysis for ethical reasons. However, the reports may still be able to indicate differences in identity through terms such as patient A and patient B, patient 001 and patient 002, etc.

Example 23: The proton pump inhibitor (PPI) was mistakenly administered to patient A instead of patient B.

In Example 23, patient A mistakenly received PPI instead of patient B; both patient A and patient B should be tagged.

When we register the attributes for ‘wrong patient’, note that ‘wrong patient’ also indicates a missed dose to the ‘intended’ patient and an extra dose to the ‘actual’ patient. We use ‘status: NE’ to describe the attributes of other NEs, e.g., drug, time, strength, etc.

4 ATTRIBUTES

To be able to classify medical incidents according to their type and what kinds of errors contribute to them, it is not enough to label the NEs alone; the properties and characteristics of each NE should also be annotated. Distinguishing between types of incident, and knowing which errors are associated with each type, would provide an opportunity to compare incident reports from different institutions and ultimately enhance patient safety improvement. In this chapter different types of attribute are introduced: generic attributes (that apply to all NEs), entity-specific attributes (that only apply to specific NEs), and entity-specific relations. Figure 4 outlines all attributes utilised in our annotation method. When assigning an attribute to an annotation, it is crucial that the annotator reads the entire incident report in order to understand the context and assign the appropriate attribute.

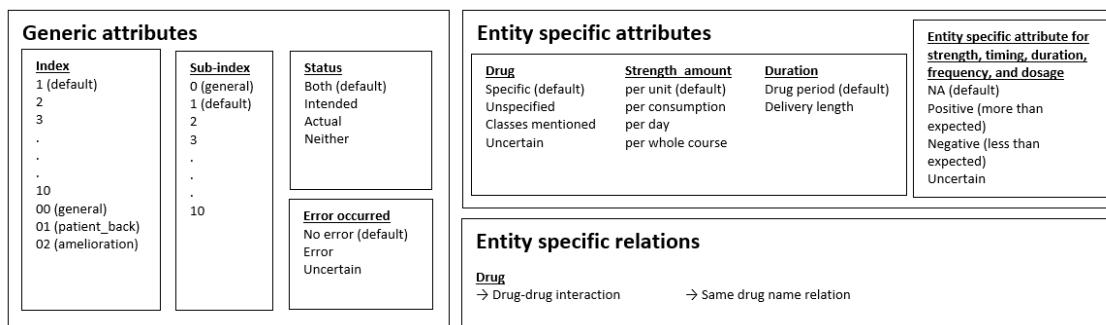


Figure 4. Overview of attributes.

4.1 GENERIC ATTRIBUTES

Generic attributes allow us to register essential information associated with each annotation. These attributes apply to every NE described in Chapter 2.5. Generic attributes include ‘relations’, ‘status’ and ‘error occurred’.

4.1.1 STATUS

To understand the use of the status attribute, annotators should first understand some fundamental things about medication incidents. An incident or near miss occurs due to a discrepancy between what is supposed to be delivered from upstream operations and what is actually delivered to downstream operations. A medication error might occur due to such a discrepancy happening across different phases of medication or different aspects of medication, such as drug, strength, etc. Using our NE framework, we wish to capture these discrepancies or the absence of such discrepancies for each annotation. Having this information will enable us to evaluate what type of incident the annotated incident report belongs to.

It is essential to identify what should have been delivered and what is actually delivered. Therefore, all NEs should be identified as either intended (what was supposed to be delivered) or actual (what was actually delivered). If the intended medication was the same as the actual one, i.e., no error occurred, then the NE should be classified as ‘intended and actual’, which indicates that there is no problem. Only when there is a discrepancy should ‘intended’ and ‘actual’ be used separately. ‘Intended and actual’ is the default.

To summarise, the possible options under the status attribute are as follows:

- Intended & actual (default)
- Intended
- Actual

Example 24:

/zoielab/supervisor/prof_wong/examples/19856

1 [[事故の内容]]

 2 ファモチジンD錠 10 mg を調剤ところを 20 mg 調剤してしまい患者が2回服用してしまう。

4 [[事故の背景要因の概要]]
 5 時間的に緊急処方箋や臨時処方箋の調剤を大量に処理しなくてはならず非常に繁忙であった。

6 確認したつもりであったがよく使用される薬剤で 20 mg もあるので間違えてピッキングしてしまった。

8 [[改善策]]
 9 確認には確認を行う。特に繁忙時間帯は。

Named entity	Intended	Actual	Incident type
Drug	Famotidine D	-	
Form – mode	D	-	
Form – form	tablets	-	
Strength – amount	10 mg	20mg	Wrong amount

In this case, there is no discrepancy between the intended drug and the actual drug delivered. They are both Famotidine. There are no discrepancies for form – mode and form – form as well. However, the intended strength is 10 mg and the actual strength is 20 mg. Through correct identification of the status attribute, we are able to determine the type of incident: a wrong amount incident. The details are shown in the above attribute summary table. Annotations are listed in order of appearance.

4.1.2 RELATIONS

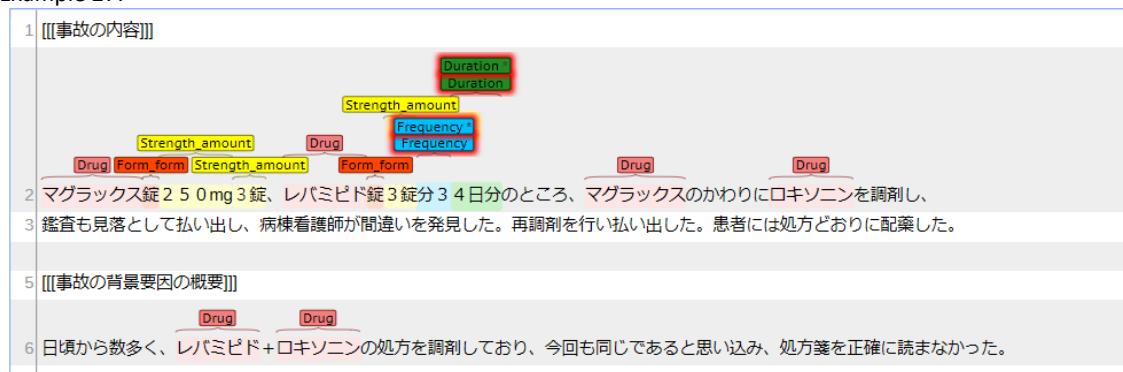
When assigning relations, we need to consider whether the tagged variables belong to any particular event. If tags belong to the same event, they will share the same relation number.

The relation number is either 1 (default) or 2. One number represents the primary event, which might involve multiple NEs. The relation number itself is not important and is generally assigned in order of appearance. If a medical incident is described by a single event, only the relation number '1' is used. If an incident is described by multiple events, all events outside of the primary event share a relation number. When two events are independent of each other, then they should be labelled with distinct relation numbers.

Example 26: *Incremin syrup [NE: Drug] 5 ml [NE: Strength – amount] was prepared for oral [NE: Route] administration in a syringe but was administered by intravenous [NE: Route] infusion.*

In Example 26, all annotations belong to one event. Therefore, we assign the same relation, 1, for all of these annotations.

Example 27:



In Example 27, the relation number '1' is applied to indicate the administration of Maglax and Loxonin, including the NEs form – form, strength – amount, dosage and duration. Relation '2' corresponds to the delivery of Rebamipide and related NEs. In this report, both relation numbers '1' and '2' apply to '3 times' and '4 days'.

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Maglax	Loxonin	Wrong drug
1	Form	tablet	-	
1	Strength – amount	250 mg	-	
1	Dosage	3	-	
1	Frequency	* 3	Note: '* 3' indicates the frequency for both drugs, therefore relation '1' and '2' are applied.	
1	Duration	Four days	Note: 'Four days' indicates the duration for both drugs, therefore relation '1' and '2' are applied.	
2	Drug	Rebamipide	-	
2	Form	tablets	-	
2	Dosage	3	-	
2	Frequency	* 3	Note: '* 3' indicates the frequency for both drugs, therefore relation '1' and '2' are applied.	
2	Duration	Four days	Note: 'Four days' indicates the duration for both drugs, therefore relation '1' and '2' are applied.	

Example 28:

http://zielab.supervisor/prof_wong/examples/8877

1	[[[事故の内容]]]	
2	腰椎圧迫骨折オペ後 80歳女性。既往にAIありペルサンチンカプセル内服中であった。	
3	しかし、OPE後よりペルサンチンカプセル中止（永久的）の指示が循環器Drよりあり。	
4	OPE後から9/12までは内服中止していたが、9/13～9/15の3日間内服されていることを発見し、服薬ボックスから外した。	

Relation	Named entity	Intended	Actual	Incident type
2	Drug	Persantin		Note: patient background info
2	Form	capsule		Note: patient background info
1	Drug	-	Persantin	Extra drug
1	Form	capsule		-
1	Timing	9/12		-
1	Duration	9/13 - 9/15		-

In this example, ‘Persantin’ and ‘capsule’ have been annotated two times. The relation number ‘2’ is applied to the first occurrence because the description is about the patient’s daily medication and is not related to this event. When relation ‘1’ is applied, it is not necessary to distinguish between intended or actual – therefore the default is selected. The second occurrence of Persantin refers to an event where the drug was given to the patient without such intention and is therefore considered an extra drug case.

4.1.3 ERROR OCCURRED

‘Error occurred’ is an attribute for indicating whether an error occurred under a particular NE label. After tagging all NEs as ‘intended and actual’, ‘intended’ or ‘actual’, a comparison of these tags will allow the incident type to be determined automatically (as detailed in Chapter 5).

When it is unclear whether an error occurred, the ‘Uncertain’ option can be used. It is important to remember that these annotation guidelines are for content-based annotation; annotation is not done when an entity or attribute is not clearly described in an incident report.

The possible options for the error occurred attribute are as follows:

No error (default)

Error

Uncertain

4.2 ENTITY-SPECIFIC ATTRIBUTES

4.2.1 DRUG-RELATED ATTRIBUTES

Drug-related attributes allow us to register information relevant to annotations under the NE ‘drug’. The drug-related attributes are as follows:

- Specific (default)
- Class mentioned
- Uncertain
- Unspecified

Example 1 in Chapter 3.1, the drugs Cefmetazon and Cefamezina were annotated. As these annotations indicate specific, identifiable drug names, we select ‘Specific’ (the default).

If the drug is not specified but the class of drug is mentioned (e.g., Example 3 in Chapter 3.1), the entity-specific attribute for the drug NE is ‘Class mentioned’.

In Example 4 of Chapter 3.1, the drug’s attribute is labelled as ‘unspecified’ because neither a specific name nor a drug class are indicated. For a list of terms commonly used when drugs are unspecified, see Chapter 3.1.

The attribute ‘uncertain’ is selected when the name of the drug is uncertain due to misspellings, etc.

4.2.2 ATTRIBUTES FOR STRENGTH – AMOUNT

As addressed in Chapter 3.3.1, strength – amount may be presented as an amount per unit, amount per consumption (i.e., a one-time dosage), amount per day (or other unit of frequency, e.g., week), or total amount for the whole medication course. We register such properties as specific attributes. The possible options for attributes under strength – amount are as follows:

- Per unit (default)
- Per consumption
- Per day or other unit
- Per course of medication

Example 31:

1 [[事故の内容]]
2 マグラックス錠250mg3錠、レバミピド錠3錠分34日分のところ、マグラックスのかわりにロキソニンを調剤し、
3 鑑査も見落として払い出し、病棟看護師が間違いを発見した。再調剤を行い払い出した。患者には処方どおりに配薬した。
5 [[事故の背景要因の概要]]
6 日頃から数多く、レバミピド+ロキソニンの処方を調剤しており、今回も同じであると思い込み、処方箋を正確に読まなかった。

Example 31 demonstrates how the amount of drug can be described by its basic unit, e.g., a 250 mg tablet of Maglax.

Example 32:

← → /zoielab/supervisor/prof_wong/examples/30184

1 [[事故の内容]]
2 ICU退室後に抗生素投与を行う際、注射処方箋に投与速度の指示がなかった。
3 全量が5mLであり、通常の小児科と同様に考えシリンジポンプを使い、30分で注入した。
4 その後夜勤者が情報収集を行ったところ、ICUのPIMSの中に指示があることに気付き、確認した。
5 指示では1時間で注入とあり、指示より急速に注入したことに気付いた。
7 [[事故の背景要因の概要]]
8 術後ICUに入室し、15日に病棟へ転棟した。術後より抗生素を開始していた。

If we were to annotate this example, a total volume of 5 ml would be annotated as 'strength – amount' and the attribute would be registered as 'per consumption'.

In case the attributes cannot accurately capture the report's narrative, 'uncertain' is used.

4.2.3 ATTRIBUTES FOR DURATION

Remember that the NE 'duration' aims to specify the period for which a drug is administered to the patient. This attribute describes the different ways duration might be presented. It is usually presented in days, weeks or months. However, clock time is sometimes used, such as 30 mins, 1 hour, etc. to indicate the period of time needed to deliver the drug (for a single consumption). While these two definitions are different in nature, both fit the concept of duration. The possible attributes for duration are as follows:

- Period over which a drug is routinely taken (default)
- Time needed to deliver a single consumption

Example 33:

A doctor ordered the administration of 100 units/kg intravenous heparin sodium injection for the treatment of deep vein thrombosis for 7 days.

Example 34:

Inhaled medical products for 14 days were finished within 5 days.

In Example 33 and Example 34, as the unit of duration is day, tagging only the number or both the number and unit are acceptable. Most incident reports use day as the unit.

Example 35:

A doctor prescribed antibiotics for 1 week.

Sometimes, week, month or other units of time are used; in such cases both the number and unit are annotated, as seen in Example 35.

Example 36:

◀ ▶ /zoielab/supervisor/prof_wong/examples/a4_blank

1	【事例の内容】
2	100/h以上の尿流出があり、11時の採血結果でK値2.9meqと低下。
	<pre>graph LR; SC[Strength concentration] --- Drug1[Drug]; SC --- Form1[Form]; DA[Strength amount] --- Drug2[Drug]; DA --- Form2[Form]; DA --- Duration[Duration]; DA --- Frequency[Frequency]</pre>
3	医師よりKCL注20meq 20ml+生理食塩液80ml 計100mlを1時間での投与を3回実施するように指示があった。
4	薬剤を準備し輸液セットもポンプ用セットを付け他看護師が準備した。

Here, the duration is registered as 1 hour. A total of 100 ml of KCL + saline solution (one consumption) was delivered for 1 hour, so '100 ml' is the strength – amount per consumption, and '1 hour' is registered as the duration, with 'Time needed to deliver a single consumption' listed as the duration-specific attribute.

4.2.4 ATTRIBUTES FOR STRENGTH, TIMING, DURATION, FREQUENCY AND DOSAGE

The NEs of strength, timing, duration, frequency, dosage and route can all be presented as numerical values. When an error has occurred but 'Intended', 'Actual' or 'Intended and actual' are not indicated, the attributes 'positive' (i.e., more than expected) and 'negative' (i.e., less than expected) are applied. 'NA' is otherwise used.

There is also an ‘uncertain’ attribute for strength, timing, duration, frequency and dosage. Unlike ‘positive’ and ‘negative’, which are only applied for numerical values or if an error has occurred, this option is applicable to any situation where the aforementioned NEs are presented in an unclear manner.

The possible attributes for the strength, timing, duration, frequency and dosage NEs are as follows:

- NA (default)
- Positive
- Negative
- Uncertain

Interpretations of ‘more than expected’ and ‘less than expected’ for each NE are listed as follows:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Strength – amount (overdose and underdose) • Strength – rate (too fast and too slow) • Strength – concentration (too high and too low) | <ul style="list-style-type: none"> • Timing (too early and too late) • Duration (too long and too short) • Frequency (too many and too few) • Dosage (too high and too low) |
|--|---|

4.3 DRUG-SPECIFIC RELATIONSHIPS

There are two relationships we wish to capture for drug NEs: drug–drug interactions and when others NEs are indicated within a drug name.

4.3.1 DRUG–DRUG INTERACTIONS

This relationship only applies to when two or more drugs have been annotated (with different relation values) and are classified as ‘actual’ or ‘intended and actual’. When one drug interacts with another, the two annotated drug NEs must be paired to determine the nature of the drug–drug interaction. No directionality is implied – the interaction might be drug A to drug B or drug B to drug A.

	Drug A	Drug B	Illustrative examples
Case 1	Intended and actual	Actual	Patient has been taking drug A for a period of time and drug B is newly prescribed.
Case 2	Actual	Actual	Drug A and B are prescribed at the same time and neither has priority. Using them together is an error.

4.3.2 DRUG NAME CONTAINS OTHER NAMED ENTITIES

This relationship is used when information pertaining to other NEs is part of the drug name (as shown in Chapter 3.1). Commercial drug names often contain information about form and strength. These concepts are annotated separately as their corresponding NEs.

These annotations apply to the drug indicated by the drug name, as such all of these NEs share the same relation number. The relationships between the drug and the associated NEs are indicated by the arrow. This attribute is applied regardless of whether the NEs are labelled as intended or actual.

Example 37:

Warfarin [NE: drug] 5 mg [NE: Strength-amount] tablets[NE: Form]

```

graph TD
    WarfarinAnnotations[Warfarin [NE: drug] 5 mg [NE: Strength-amount] tablets[NE: Form]] --- Warfarin
    PrecedexAnnotations[Precedex [NE: drug] intravenous solution [NE: form] 200μg [NE: Strength] 200μg/2ml [NE: Strength - concentration]] --- Precedex
  
```

Precedex [NE: drug] intravenous solution [NE: form] 200 μ g [NE: Strength] 200 μ g/2ml [NE: Strength - concentration]

4.4 CHAPTER SUMMARY

Table 3 summarises information that has been presented on generic attributes, entity-specific attributes and drug-specific relationships in this chapter.

Table 2. The use of attributes across NEs.

Name Entities	Generic attributes				Entity-specific attributes				Drug-specific relationships	
	Index	Sub-index	Status	Error occurred	Drug-specific attributes	Attributes for strength-amount	Attributes for duration	Attributes for strength, timing, duration, frequency and dosage	Drug-drug interaction	Drug name contains other NEs
Wrong patient	○	○	○	○	×	×	×	×	×	×
Drug	○	○	○	○	○	×	×	×	○	○
Form	○	○	○	○	×	×	×	×	×	○
Strength	○	○	○	○	×	○	×	○	×	○
Timing	○	○	○	○	×	×	×	○	×	×
Duration	○	○	○	○	×	×	○	○	×	×
Frequency	○	○	○	○	×	×	×	○	×	×
Dosage	○	○	○	○	×	×	×	○	×	×
Route	○	○	○	○	×	×	×	×	×	×

5 INCIDENT TYPES

Figure 5 summarises the entire conceptual framework of the annotation scheme, including structured items.

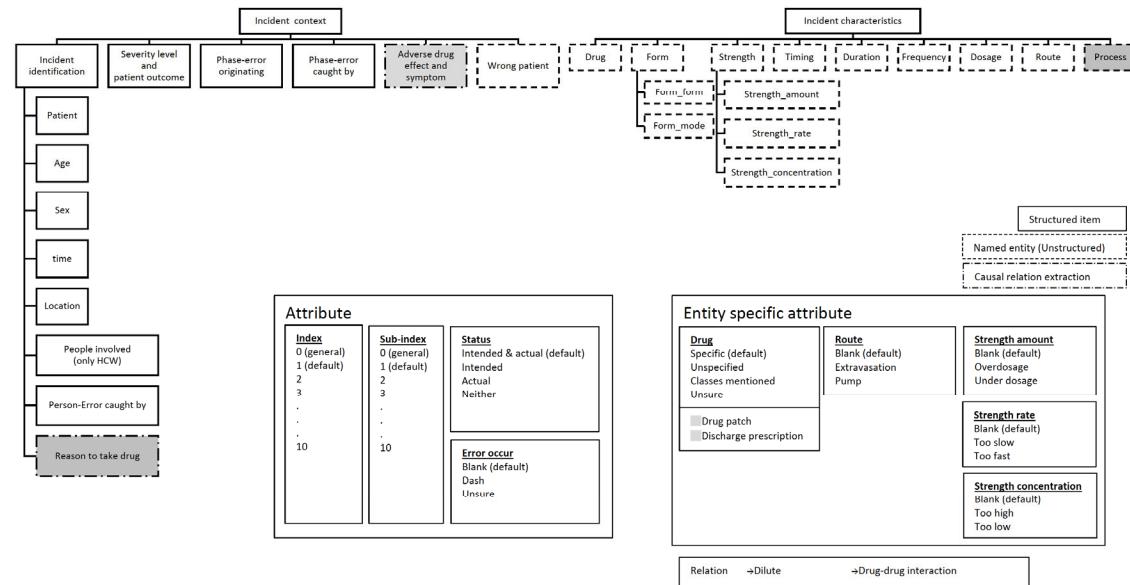


Figure 5. Conceptual framework for the classification theme.

The incident type can be determined by a comparison of the attributes ‘intended’ and ‘actual’. One report might contain multiple incidents.

Table 3. Incident types resulting from combinations of NEs.

Named entity	Intended	Actual	Incident type
Drug	A	B	Wrong drug
Drug	A	-	Omission
Drug	-	A	Extra drug
Drug (with different indices)	NA	A --> B	Drug–drug interaction
Form – form	A	B	Wrong form
Form – mode	A	B	Wrong mode
Strength – amount	A	B	Wrong amount
Strength – rate	A	B	Wrong rate
Strength – concentration	A	B	Wrong concentration
Timing	A	B	Wrong timing
Duration	A	B	Wrong duration
Frequency	A	B	Wrong frequency
Dosage	A	B	Wrong dosage
Route	A	B	Wrong route
Wrong patient	A	B	Wrong patient

*NA = not applicable

5.1 WRONG DRUG

Wrong drug occurs when inappropriate medication or IV fluid is prescribed, dispensed, prepared or administered [10]. Wrong drug applies when the intended drug and the actual drug are different. A generic substitution is not considered as a wrong drug [10].

Example 38:

/txt_format/JQ/JQ50/1				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	Noborin	Humulin	Wrong drug
1	Mode	R	R	
1	Amount	2 doses	2 doses	

We can see that Humulin was delivered to the patient instead of Noborin, so the incident is tagged as ‘wrong drug’. The mode and amount information are not marked as wrong because ‘wrong drug’ has already been applied and it is an incident of a higher level.

Example 39:

/txt_format/JQ/JQ50/16				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	Esrax	Neosynergyn	Wrong drug

In this example, wrong drug is indicated by the discrepancy between ‘intended’ and ‘actual’.

Example 40:

◀ ▶ /txt_format/JQ/JQ50/20				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	Lamotrigine	Lamisil	Wrong drug
1	Form	tablet	tablet	

In this example, form is not connected to any incident type because ‘wrong drug’ has already been applied, which is a higher level in the incident hierarchy.

5.2 DRUG OMISSION

Omission is the failure to administer an ordered dose to a patient before the next scheduled dose. This excludes patients who refuse to take medication or a decision not to administer [22].

Example 41:

◀ ▶ /txt_format/JQ/JQ50/0				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	Humulin		
1	Mode	R		
1	Route	subcutaneous injection		
2	Drug	Insulin		Omission

In this example, the patient’s daily medication and the incident are distinct, thus two relation numbers are used.

Example 42:

/txt_format/JQ/JQ50/2

1	[[[事故の内容]]]
2	心不全にて入院中の89歳の患者。
3	Drug ** ピソノテープの貼用と、ニトロダームの貼用を毎日行っていた。
4	11月10日に、日勤の看護处置一覧を印刷する際に、ABCチームの全部を当事者が印刷した。
5	その際に、○号室の看護处置一覧を、印刷できていなかったのではないかと考えられる。
6	看護处置一覧を印刷すると、処置の内容と時間が記載されるが、○号室が抜けていることに気づかず、当事者は○号室が自分の部屋持ちと認識できていなかった。
7	そのため、日勤中の観察と処置ができるおらず、準夜勤務者がピソノテープとニトロダームが、更新されていないことに気づき指摘され、
8	そのときに、○号室が当日の部屋持ちであったことを知り、観察と処置が行えていないことに気づいた。
10	[[[事故の背景要因の概要]]]
11	1申し送りの時間が迫っていたため焦っており、部屋持ち患者の把握と看護处置の印刷ができていなかった。
12	2部屋持ち以外のチームの看護处置一覧を印刷していく、責任の所在が曖昧になっていた。
14	[[[改善策]]]
15	1出勤した際は、必ず自分の部屋持ち患者と、処置にの把握を行う。また必ず患者の元へ挨拶に行く。
16	2自分のチームの看護处置一覧の印刷は、必ず自分で行う。
17	3Aチームは個室を見るという意識付けをする。
18	4アサインメントボードで部屋持ちの確認をし、印刷をする。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Bisono tape		Omission
2	Drug	Nitroderm tape		Omission

In this case, the issuance of two patch drugs is missed. This example is simple and can be identified from the NEs, but some cases involving patches are difficult to interpret with the current NEs. For this reason, a drug-specific attribute should be used to mark patch-related cases: 'drug patch'.

Omission is sometimes related to a case of wrong timing (see the example in Chapter 5.12). When the report used multiple NEs to indicate the situation of an omission case, e.g., with timing, duration, drug name, we indicate all as 'intended' and 'error occurred'.

5.3 EXTRA DRUG

'Extra drug' can be applied to two different situations. The first is when the drug is not called for. Examples include a drug not indicated in the report being prescribed or administered to the patient, a drug being continued despite a clinically significant adverse drug reaction, a drug no longer called for being reordered or a drug that should be discontinued being continued instead.

The second situation to which 'wrong drug' applies is the issue of duplication. For example, two orders are mistakenly prescribed for one medication and both orders are active, two orders for the same medication are active on two different charts or the same drug is prescribed or administered twice, once as a single agent and again as a combination product [10].

Example 43:

/txt_format/Pilot_sample_30cases/8877

1	[[[事故の内容]]]
2	腰椎圧迫骨折オペ後80歳女性。既往にAfありペルサンチンカプセル内服中であった。
3	Drug Form_form しかし、OPE後よりペルサンチンカプセル中止（永久的）の指示が循環器Drよりあり。
4	OPE後から9/12までは内服中止していたが、9/13～9/15の3日間内服されていることを発見し、服薬ボックスから外した。
6	[[[事故の背景要因の概要]]]
7	不明
9	[[[改善策]]]
10	中止薬がある場合は医師に報告し中止してもらう。定期交換時はその日の受け持ち看護師が必ず前回処方箋を確認するよう徹底していく。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Persantin		
1	Form	capsules		
2	Drug	-	Persantin	Extra drug
2	Form	capsule	capsule	

In this example, the first sentence is about the patient's daily medication and is thus distinct from the event.

Example 44:

[⬅ ➡ /txt_format/JQ/JQ50-2/69](#)

1 [[事故の内容]]

2 緩和目的で入院中の患者。コデインを朝・昼・夕・睡前で1錠ずつ内服していた。

3 当日昼分のコデインリン酸塩錠を配薬ケースに入れた上で、明日分を準備。

4 服用ケースに本日昼分を入れたことを担当看護師に伝えていなかったため、担当看護師が明日分のケースから昼分を出し、重複して服用させてしまった。

6 [[事故の背景要因の概要]]

7 担当看護師以外が配薬ケースに入れたことや、明日分が準備されていることを声掛け、確認するなどの行為が行われなかった。

9 [[改善策]]

10 麻薬は昼分と記入された袋に入れており、その袋のままケースに入れておく。準備した際は責任を持って確実に伝達する。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	codeine		
1	Timing	morning		
1	Timing	noon		
1	Timing	evening		
1	Timing	before sleeping		
1	Dosage	one tablet		
2	Drug		codeine phosphate	Extra drug
2	Form	tablet	tablet	

In this example, the same drug is administered twice as a single agent. The first sentence is about the patient's daily medication. This incident is not considered 'wrong timing' because the drug intended for tomorrow, noon is given at noon.

Example 45:

[⬅ ➡ /txt_format/JQ/JQ50-2/96](#)

1 [[事故の内容]]

2 患者は多発性骨髄腫の治療でファリーダックを月・水・金曜日の朝食後に内服し、投薬カレンダーで内服自己管理をしていた。

3 好中球減少のため、主治医よりファリーダック中止の一時指示が入力された。

4 前日の日勤リーダー看護師Aは、翌日のワークシートに反映されることを確認し、指示受けを行なった。

5 前日の患者担当看護師B（長日勤）は、翌日ワークシートの転記時にファリーダック中止の一時指示を見落としたため、投薬カレンダーにはファリーダックが入ったままの状態となっていた。

6 当日の夜勤看護師Cもファリーダック中止の一時指示を見落としたため、ファリーダックが抜かれているか、投薬カレンダーの中を確認していなかった。

7 患者は朝食後に、ファリーダックを内服し、夜勤看護師Cは内服確認を行った。夜勤から日勤への引継ぎ時に、ファリーダックは中止であると指摘を受け事象が発覚した。

9 [[事故の背景要因の概要]]

- 10 ・看護師Aは多くの指示受けをしなければならず、翌日指示はワークシートに反映されるため、指示受け内容は担当者には伝達しなかった。
- 11 ・看護師B（長日勤）は、業務が繁忙で17時前にワークシートの転記を開始。長日の検温に回らなければという気持ちの焦りがあった。
- 12 ・夜勤看護師Cは、業務は繁忙ではなかったが、たまたま抜けてしまった。

14 [[改善策]]

- 15 ・指示受けの際に、担当者に受けた指示内容について声かけやメモを渡していく。（特に内服薬を抜く作業が発生する指示）
- 16 ・ワークシートの転記は時間に余裕を持って行なえるようにしていく。
- 17 ・ワークシートの情報は漏れないないように、指針しながら情報収集を行う。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Farydak		
1	Timing	Mondays		
1	Timing	Wednesdays		
1	Timing	Fridays		
1	Timing	after breakfast		
2	Drug		Farydak	Extra drug

In this example, ‘timing’ has two distinct meanings: timing as it relates to the week and timing as it relates to the day. As neither of them are related to the incident they are annotated with a different relation number. If these were related to the incident, then subindices would be used. An extra drug, or an omitted drug, is sometimes related to a case of wrong timing. See, for example, Chapter 5.12.

5.4 DRUG—DRUG INTERACTION

A drug–drug interaction is a common type of incident and can be labelled as ‘drug–drug interaction’ (refer to Chapter 0)

5.5 WRONG FORM

Wrong form occurs when the wrong form of drug is ordered, dispensed or administered.

Example 46:



Relation	Named entity	Intended	Actual	Incident type
1	Drug	diltiazem hydrochloride	diltiazem hydrochloride	
1	Form – form	tablets	capsules	Wrong mode

In this example, an agent that has a different form is dispensed.

5.6 WRONG MODE

Wrong mode occurs when the wrong mode of a medication is ordered, dispensed or administered.

Example 47:

/txt_format/JQ/extrajQ/a2				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	sodium valproate	sodium valproate	
1	Mode		R	Wrong mode

In this example, the drug mode is wrong even though the form is the same. Only the mode for the drug actually given, 'R', is specified (in the drug name). The mode of the drug intended for administration is left blank. This is a 'wrong mode' incident.

5.7 WRONG AMOUNT

Wrong amount is defined as a dose of medication or volume of IV fluid over or under the intended amount, taking into account the patient's age, weight, renal and liver function [10].

Example 48:

/txt_format/JQ/JQ400/16369				
Relation	Named entity	Intended	Actual	Incident type
1	Drug	Oxycontin	Oxycontin	
1	Amount	20 mg	5 mg	Wrong amount
1	Timing	morning	morning	
1	Timing	after dinner	after dinner	
1	Dosage	one tablet	one tablet	

In this example, amount is the titre of the drug.

Example 49:

[◀](#) [▶](#) /txt_format/JQ/JQ400/18326

1	[[[事故の内容]]]
2	昨日16時半からドルミカム0.5ml/Hでセデーション開始していた。
3	患者の状態により、一時間分早送りをするという指示があり、早送りを行ったが、早押しボタンを長押ししづぎて0.7ml静注してしまった。
5	[[[事故の背景要因の概要]]]
6	・4ヶ月ぶりにシリジンポンプを使用し、早送りの方法が不十分であった。・手技が未熟であった。
8	[[[改善策]]]
9	・シリジンポンプの練習をし、使いこなせるようにする。・できるようになるまで先輩に見ていただく。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Dolmicam	Dolmicam	
1	Rate	0.5ml/H	0.5ml/H	
1	Amount		0.7ml	Wrong amount

In this example, a medication rate (0.5ml/h) is annotated. Later, a strength – amount that was mistakenly given to the patient (0.7 ml) is mentioned, but without note of what the intended amount was.

5.8 WRONG RATE

Wrong rate is defined as a rate, e.g., IV rate, being slower or faster than intended [10].

Example 50:

[◀](#) [▶](#) /txt_format/JQ/JQ50/23

1	[[[事故の内容]]]
2	医師は患児にソルデム200mLを2時間、側管から生食50mL+ソルメルコート0.5Vを30分の指示があり
3	看護師はそれぞれに輸液ポンプをつけ共に100mL/hでセットしたつもりだったが、ソルデム200mLの輸液ポンプは200mL/hになっており、指示より早く滴下してしまった
5	[[[事故の背景要因の概要]]]
6	・小児点滴が多く多忙だった
7	・輸液ポンプ設置後、ダブルチェックを行わなかった
8	・指さし呼称を行わなかった
10	[[[改善策]]]
11	・輸液ポンプ施行時は、再度確認を行う
12	・指さし確認を行う

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Soldem	Soldem	
1	Amount	200ml	200ml	
1	Rate	100ml/h	200ml/h	Wrong rate
2	Drug	food	food	
2	Amount	50 ml	50 ml	
2	Drug	Solu-Medrol	Solu-Medrol	
2	Dosage	0.5 v	0.5 V	
2	Rate	100 ml/h	100 ml/h	

In this example, the drugs represented by relation '2' interact with each other, which is why they share a relation number. Intravenous drugs are generally prescribed as a single dose, 'food 50 ml' and 'Solu-Medrol 0.5 v' indicate a single dose and are annotated using 'dosage'. '100ml/H' is annotated twice because it is a rate for the drug of relation 1 and relation 2.

Example 51:

[◀](#) [▶](#) /txt_format/JQ/JQ50-2/70

1	[[事故の内容]]
2	シスプラチン3クール投与1日目の患者。
3	輸液ポンプ使用し点滴投与していた。
4	当日、当事者は当該患者の担当ではなかった。
5	当事者は当該患者のナースコールで訪室し20%マンニットール注射液を400mL／時間での投与が終了していることに気付いた。
6	20%マンニットール注射液を400mL／時間での投与終了後、シスプラチンを250mL／時間で投与する指示であった。
7	しかし、シスプラチンに切り替えた後に投与速度を変更せず、シスプラチンを400mL／時間で投与してしまった。
8	シスプラチン投与開始して5分以内に当事者以外の看護師が発見し直ぐに中止した。
9	医師に報告し、残りのシスプラチンを250mL／時間で投与した。
11	[[事故の背景要因の概要]]
12	点滴切り替え時に点滴の指示を確認していなかった。
13	抗悪性腫瘍薬の適切な投与速度、投与速度が速いことによる有害事象に関する知識が不足していた。
15	[[改善策]]
16	点滴投与前に点滴の指示やクレンメの開封の有無、ラインの破損の有無等の確認を指差し呼称で行う。
17	抗悪性腫瘍薬に関する知識を充足させる。
18	担当以外の患者のナースコールに対する対応で分からることは担当の看護師に確認する。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Cisplatin	Cisplatin	
2	Concentration	20%	20%	
2	Drug	Mannitol	Mannitol	
2	Form	injection	Injection	
2	Rate	400ml/hr	400ml/hr	
1	Rate	250ml/hr	400ml/hr	Wrong rate
1	Drug	Cisplatin		
1	Rate	250ml/hr		

In this example, action taken after the incident is also described. This information is annotated with the relation number '2' because it is not part of the main incident.

Example 52:

[◀](#) [▶](#) /txt_format/JQ/extrajQ/a4

1	【事例の内容】			
2	100ml以上の尿流出があり、11時の採血結果でK値2.9meqと低下。	Diluted		
3	医師よりKCL注20meq 20ml+生理食塩液80ml 計100mlを1時間での投与を3回実施するように指示があった。	Drug	Strength_concentration	Strength_amount
4	薬剤を準備し輸液セットもポンプ用セットを付け他看護師が準備した。	Drug	Form_form	Strength_rate
5	患者に投与する際、担当看護師に、KCLの投与経験を確認すると投与の経験があると返答したため、準備した薬剤を担当看護師に渡し接続を依頼した。	Drug	Form_form	Frequency
6	約15分後、患者の所へ行くと、KCL+生理食塩液が輸液ポンプを使用せず、手動で約50ml投与されているところを発見。	Drug	Form_form	Strength_amount ***
7	倍速投与となった。直ちに投与を中止し状態観察を実施。		Strength_rate ***	
8	致死性不整脈がないことを確認し、以後は輸液ポンプを使用し投与した。			
9	その後、患者のバイタルの異常なく経過。医師へ報告し経過観察となった。			
10	【事例の背景要因の概要】			
11	・他看護師は担当看護師が投与経験があると回答したため、側で確認・指導することなくその場を離れた。			
12	・担当看護師はKCLについての知識が不足していた。			

Multiple incidents are captured in this example. Rate is closely related to amount, so sometimes ‘wrong rate’ and ‘wrong amount’ occur together. Sometimes the exact amount, rate or concentration are not mentioned in the incident report. In such cases, ‘entity-specific attributes’ can be used to indicate the incident type. In this example, while rate is not explicitly mentioned, use of the ‘too fast’ attribute indicates that the rate is faster than intended. Similarly, while amount was not clearly mentioned, use of the ‘overdosage’ attribute indicates that an amount larger than intended was administered. Note that while the amount 50 ml is less than what was planned, if the amount administered over a period of time is considered, then an overdosage should be labelled.

5.9 WRONG CONCENTRATION

Wrong concentration is defined as the concentration of a medication being higher or lower than intended [10]. Concentration is also closely related to amount and rate; most cases of ‘wrong concentration’ co-occur with ‘wrong rate’ or ‘wrong amount’. A wrong concentration might be reported as a wrong amount.

Example 53:

[/txt_format/JQ/extrajQ/a3](#)

1 【事例の内容】

2 アスパラギン酸カリウム注 1.0mEq 1.0ml キット1本をドフ^W糖注 5% 1.0mL 1瓶に溶解し1時間で投与するオーダにおいて、

3 添付文書では「濃度は 40mEq/L 以下として1分間 8mL を超えない速度で点滴静脈内注射する」とされているが疑義照会せず、オーダを出した。

4 その後、病棟看護師にて病棟薬剤師に問い合わせがあり、発覚した。

5 【事例の背景要因の概要】

6 カリウム製剤において「濃度 40mEq/L 以下、速度 20mEq/h 以下で投与」という認識はあったが、

7 速度 20mEq/h 以下であれば濃度 40mEq/L 以上であっても許容してよいというような指導を受けていたため、誤った認識により判断を誤ってしまった。

8 【改善策】

9 不明

Relation	Named entity	Intended	Actual	Incident type
1	Drug	potassium aspartate	potassium aspartate	
1	Form	Injection	Injection	
1	Strength-amount	10mEq10ml	10mEq10ml	
1	Dosage	one bottle	one bottle	
2	Drug	glucose	glucose	
2	Concentration	5%	5%	
2	Strength-amount	100ml	100ml	
2	Dosage	one kit	one kit	
1	Rate	8ml/min	20mEq/hr	Wrong rate
	Duration		one hour	
1	Concentration	40mEq/L		Wrong concentration Positive – more than expected

As mentioned before, an intravenous infusion is generally prescribed as a single dose, which is why ‘one bottle’ and ‘one kit’ are annotated as a single dose using ‘dosage’. As was the case previously, the rate is also not explicitly mentioned, but this time, an indication that the rate is too high or too low can also not be found. In this case, we use the label ‘unsure’ under the attribute ‘error occurred’. While there is no ‘actual’ concentration mentioned, it is possible to deduce from the amount that the concentration is higher than recommended.

5.10 WRONG TIMING

Timing-related errors are defined as administration too early or too late, relative to the time designated by the healthcare facility [22]. There are three scenarios associated with wrong timing:

- 1) No 'omission' or 'extra drug' results from wrong timing (Example 54)
- 2) 'Omission' results from wrong timing (Example 56)
- 3) 'Extra drug' results from wrong timing (Example 57)

Example 54:

[/txt_format/Pilot_sample_30cases/39978](#)

```

1 [[[事故の内容]]]
2 12：30痛くて昼食が食べられないと訴えあり。
3 Timing Drug
4 9：00内服予定であったオキシコンチン錠を内服していないことに気付く。すぐに内服していただく。
5 [[[事故の背景要因の概要]]]
6 朝の申し送り時、確認不足であった。看護指示から、指示うけできず、9：00に内服があることを確認できていなかった。
8 [[[改善策]]]
9 申し送り時、受持ち患者の麻薬は、自分で確認し、注意を促す。申し送り前に患者情報を取り、確認する。

```

Relation	Named entity	Intended	Actual	Incident type
1	Timing	9:00		Wrong timing
1	Drug	Oxycontin	Oxycontin	
1	Form	tablets	tablets	

Example 55:

[/txt_format/JQ/JQ50/21](#)

```

1 [[[事故の内容]]]
2 Drug
3 持参薬で薬袋に記入されている用法を鑑別書に入力し鑑別書を作成した。
4 Timing Timing Timing Timing Timing Timing
5 [[[事故の背景要因の概要]]]
6 多忙で確認が疎かになってしまった
7 鑑別後に最終確認を怠ってしまった
8 Drug Frequency
9 ステロイドは1日3回の服用はあまりなく、考えなしに行っていた
10 [[[改善策]]]
11 鑑別書と薬剤を確認する
12 多忙でも冷静に対応する
13 自分の目できちんと情報を取る
14 持参薬の内容を見て適切か考えて作成する

```

Relation	Named entity	Intended	Actual	Incident type
1	Drug	medication	medication	
1	Timing	after breakfast	after breakfast	
1	Timing	lunch	lunch	
1	Timing		dinner	Wrong timing
1	Frequency	2 times a day	3 times a day	Extra drug

Example 56:

◀ ▶ /txt_format/JQ/JQ50/19				
1 [[事故の内容]]				
  2 本日、2時、10時、18時にフィニパックスの指示がおされていたが看護師は指示を見落とし2時の点滴を施行しなかった				
4 [[事故の背景要因の概要]]				
5 患者の注射処方箋が3枚あり、3枚目に抗生剤の指示が記載されていた。指示内容を見たつもりであったが見落としていた				
7 [[改善策]]				
8 ワークシートを活用する				
9 処方箋は最後のページまで目を通す				

Relation	Named entity	Intended	Actual	Incident type
1	Timing	2:00		Omission
1	Timing	10:00	10:00	
1	Timing	18:00	18:00	
1	Drug	Finibax	Finibax	

In this case, wrong timing led to the drug administration being skipped. If the drug is administered after detecting the delay, then it is not an omission error but an error of wrong timing. However, this was not explicitly described in the text. Therefore, an omission error is registered.

Example 57:

◀ ▶ /txt_format/JQ/JQ50/10				
1 [[事故の内容]]				
   2 朝のラウンド時に朝の内服を準備するよう声かけし、食後内服の確認に行くと、昼食後のエペリゾンを内服してしまっていることを発見する。				
3 朝食後の内服（一包化）の中にも同じ薬が入っており重複内服となつた。医師報告し様子観察となる。				
5 [[事故の背景要因の概要]]				
6 内服自己管理中の患者。看護師は食前薬の準備と服薬確認を実施していたが、朝、患者が寝ていたこと、				
7 また、本日退院でもあったため、食後薬の準備しておいてくださいと声かけをしただけで、実際に準備するところを確認しなかった。				
9 [[改善策]]				
10 本日退院予定のため薬包をしっかり確認するよう説明した。				

Relation	Named entity	Intended	Actual	Incident type
1	Timing	Morning	after lunch	Wrong timing
1	Drug		Eperisone	

In this example, a drug is administered at the wrong timing, but the intended timing is unclear, so the 'unsure' attribute could be used under the 'error occurred' field.

5.11 WRONG DURATION

Wrong duration refers to the medication being administered for a longer or shorter period than intended.

Example 58:

[/txt_format/JQ/JQ50/12](#)

1	[[事故の内容]]
2	患者より次の吸入薬をくださいと希望あり。
3	吸入薬を確認すると11／17処方のスピリオルレスピマット（28吸込分）が空になっている。
4	1日1回2吸込のため、10日分以上はあるはずだが、5日間でなくなってしまった。
5	本人に吸入について確認すると「1日1回、1回2吸込だよ」と吸入回数理解されている。
6	以前吸入手技確認した際も問題はなかった。
7	主治医に上記報告。そのまま吸入継続でよいと指示あり。
9	[[事故の背景要因の概要]]
10	吸入を重ねて実施してしまった可能性や空打ちを何度も実施していた可能性があるが、
11	退院後自己管理になるため吸入薬を患者管理にしちゃい、毎日残量を確認できていなかった。
13	[[改善策]]
14	吸入手技だけでなく、残量も確認する。
15	管理が不十分である場合は看護師管理とする。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	inhalant Spiriva Respimat	inhalant Spiriva Respimat	
1	Amount	28 inhalations	28 inhalations	
1	Frequency	once a day	once a day	
1	Dosage	two puffs	two puffs	
1	Duration	10 days	5 days	Wrong duration

In this example, based on the drugs remaining, the prescribed duration didn't match the actual duration. Here, drug is expressed using both a generic description of form and a specific name. Both represent the same drug and so share the same relation number.

5.12 WRONG FREQUENCY

A wrong frequency occurs when the prescribed or administered frequency of delivery for a drug or an IV rate falls outside of the recommended range or planned number [10]. If the frequency is larger, it is often also labelled as an extra drug. If the frequency is smaller, then 'omission' is applicable. Wrong timing is also relevant in such cases.

Example 59:

[/txt_format/JQ/JQ400/11891](#)

1	[[事故の内容]]
2	ロキソプロフェン 1日2回朝、夕のところ、1日3回にセットし昼も投与した。患者より服用後に報告があった。
4	[[事故の背景要因の概要]]
5	確認不足。

7 [[改善策]]

8 1回配薬の患者の内服薬をセットする際に全ての内服薬に残数と、セット者、配薬者を記載した紙を作り、内服薬の袋に貼り、ダブルチェックを徹底する。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Loxoprofen	Loxoprofen	
1	Frequency	twice a day	three times a day	Wrong frequency
1	Timing	morning	morning	
1	Timing	evening	evening	
1	Timing		afternoon	Wrong timing

In this example, both frequency and timing are wrong.

5.13 WRONG DOSAGE

Patients may be subject to excessive or insufficient amounts of a drug.

Example 60:

[◀](#) [▶](#) /txt_format/JQ/JQ400/14659

1	[[[事故の内容]]]
	Drug Dosage
2	疼痛の訴えあり、指示薬のカロナールを1錠与薬した。
	Dosage
3	カルテに記載時、前日と量が異なるため確認したところ、指示は2錠であり、過少与薬が発覚した。
4	気が付いた際患者は入眠中であり、起床時に疼痛の訴えがなかったため経過観察とした。
6	[[[事故の背景要因の概要]]]
7	一般指示、処方箋の確認が不十分であった。
9	[[[改善策]]]
10	ダブルチェック時、与薬時に5 Rでの確認を行う。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Calonal	Calonal	
1	Dosage	2 tablets	1 tablet	Wrong dosage

In this example, the actual dosage is smaller than the intended amount.

Example 61:

[◀](#) [▶](#) /txt_format/JQ/JQ50/28

1	[[[事故の内容]]]
	Strength_amount Strength_amount Frequency Drug Dosage
2	27日からセレコックス(100) 2錠2×1の指示あり。15時頃、内服薬が薬剤部から届いたため、本日の分を内服させた。
	Dosage Dosage
3	16時30分、準夜勤務看護師に、本日の夕分は時間がずれることを申し送っている際に、1回一錠ではなく、2錠内服させたことに気付いた
5	[[[事故の背景要因の概要]]]
	Strength_amount Dosage Timing Frequency Dosage Dosage Timing Dosage
6	・「2錠2×1は朝1錠・夕1錠」内服することは知っていたが、1回2錠と思いこんだ。 7 ・5R確認の怠り。
9	[[[改善策]]]
10	・5Rの徹底。
11	・指差し、呼称で確認する。

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Celecoxib	Celecoxib	
1	Amount	100	100	
1	Amount	2 tablets	2 tablets	
1	Frequency	2x	2x	
1	Dosage	one tablet	two tablets	Wrong dosage

In this example, '2 tablets' is annotated as 'amount' because it is the total amount of tablets for a day. Also '2 tablets' is annotated as 'dosage, actual' because it is a single unit that was wrongly given to the patient.

Dosage is defined as the number of units (e.g., tablets, bottles and ampules) given to the patient as a single dose. However, sometimes the total amount of units is described instead of single dose. In such a situation, the total amount of units is annotated as amount.

5.14 WRONG ROUTE

Wrong route occurs when a medication is prescribed or administered via an incorrect route of administration, e.g., a drug that creates strong vascular irritation and should be given via the central line is administered via the peripheral line.

Example 61:

⬅ ➡ /txt_format/JQ/extra_JQ/a6				
1	【実施した医療行為の目的】			
2	薬剤の投与経路間違い			
3	【事故の内容】			
4	看護師 A は、処方指示画面を確認し、インクレミンシロップ 5cc を透明シリングに準備し、看護師 B へ他の錠剤と一緒に手渡した。	Drug	Form_form	Strength_amount
5	看護師 B は患者の病室を訪問し、最初に錠剤を内服してもらった。	Drug	Route **	Form_form
6	その後、左正中皮静脈に留置（生食ロック）されていた末梢ルートから透明シリングに入った液体（インクレミンシロップ） 5cc を注入した。	Drug	Form_form	Route **
7	その後、嘔気・嘔吐が出現。	Drug	Form_form	Route **
8	同じ頃、ナースステーションのモニター上頻脈を確認し看護師 C が訪問し、状況を確認したところ、誤ってインクレミンシロップを静脈内注射したことが分かった。	Drug	Form_form	Route **

Relation	Named entity	Intended	Actual	Incident type
1	Drug	Incremin	Incremin	
1	Form	syrup	syrup	
1	Amount	5 ml	5 ml	
1	Route	oral	intravenous	Wrong route

Other errors

We may find other errors that are not covered by the current scope of this annotation guide, e.g., procedural errors such as forgetting to fill out a questionnaire before administrating a vaccine to a patient. Such cases do not register as an error under any of our NEs.

5.15 WRONG PATIENT

'Wrong patient' applies to situations in which medication is prescribed or delivered to the wrong patient [10]. In these cases, all other attributes are annotated normally. Patient is typically part of incident identification and is therefore structured information; it is only annotated when a 'wrong patient' incident occurs. All patients related to the incident are annotated: 'intended' and 'wrong patient' for the patient who didn't receive the intended drug and 'actual' and 'wrong patient' for the patient who received an unintended drug.

Example 62:

⬅ ➡ /txt_format/JQ/JQ50/15				
1	[[事故の内容]]			
2	救命の患者 A と患者 B を受け持ちしていた。			
3	23時に患者 A のタケプロン投与指示があり、患者 B は 0 時にタケプロン投与指示があった。			
4	23時半頃、患者 A のタケプロンを患者 B のベッドサイドへ持つて行き、PDA で投与前確認すると、「×」が表示され、患者間違いに気付く。			
6	[[事故の背景要因の概要]]			
7	思い込み。患者氏名の確認不足。			
9	[[改善策]]			
10	患者氏名と投与時刻、薬剤名を確認し、ベッドサイドへ持つて行く。			
11	また、必ず PDA で患者認証を実施してから、投与する。			

Index	Subindex	Named entity	Intended	Actual	Incident type
1	1	Wrong patient	Patient A	Patient B	Wrong patient
1	1	Timing	11:00 pm	11:00 pm	
1	2	Timing	00:00 am	00:00 am	
1	1	Drug	Takepron	Takepron	

The above example features both patient A and patient B equally, but patient B is tagged as the actual patient because patient B received the unintended drug. There are two moments of time mentioned here, as indicated by subindices '1' and '2', but this is not a 'wrong timing' or 'wrong drug' incident because it has already been marked as 'wrong patient'. There is nothing to suggest it is an 'omission' or 'extra drug' case.

Example 63:

◀ ▶ /txt_format/JQ/JQ50-2/54					
Index	Subindex	Named entity	Intended	Actual	Incident type
1	1	Wrong patient	another patient	patient	Wrong patient
1	1	Drug		Alosenn	Extra drug
1	1	Strength – amount		1 g	

The above example is a 'wrong patient' incident, as indicated by the 'intended' and 'actual' attributes. Unlike the previous example, the drug mistakenly given to the 'actual' patient was not supposed to be given to the 'intended' patient either; this is considered 'extra drug'. Deciding which incident type is applicable, and how many, depends on way the incident report is written. If the incident type is not apparent based on the report, we do not annotate. Timings related to Patient A or B only can be differentiated using subindices.

6 CONCLUSION

These guidelines demonstrated how to manually annotate medical incident reports for the creation of gold-standard data, which is used for training artificial intelligence to conduct automated annotation.

The named entities found within reports, and their attributes, were introduced and explained with examples. Incident types, certain combinations of annotations that can be interpreted systematically, were also described.

Together with recent advances in named entity recognition, these guidelines provide a framework for extracting actionable data from unstructured textual reports. This approach could revolutionise the collection, utilisation and retrieval of information from incident reports – an exciting prospect for the future of patient safety.

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