MEDICATION INCIDENTS REPORTING PROGRAMME

醫院管理局 HOSPITAL AUTHORITY

10 years experience in MIRP

In 1994/1995, when the HA-wide Medication Incident Reporting Programme was first implemented, 8,106 medication incidents were voluntarily reported, which was increased to 18,349 in 2003/2004. This increase in reports is a positive step toward identifying and eliminating medication errors and ensuring the safety and well-being of all hospital patients. By identifying medication error trends and problem areas, hospitals will be able to prevent future errors and enhance quality of patient care.

Amongst the reported incidents, 0.6% (52 incidents) of the total incidents that occurred did have impact on patients. Figure 2 and Table 1 overleaf list the 10 medications that were most frequently reported to MIRP and their associated problems from 1998 to 2003. The top categories of drugs most commonly involved in medication errors were insulin, potassium chloride and morphine, similar to the US data reported to the Institute of Safe Medication Practice. These high-alert medications (i.e. medications with a high risk of causing injury when they are misused) were responsible for the most severe injuries. Thus, targeting on these high alert medications could help to prevent severe medication incidents. In the past, various working groups had been formed and guidelines and recommendations had been issued for improving the safe use of these medications. Apart from these, heparin, midazolam, pethidine, adrenaline, fentanyl and nifedipine have also been frequently associated in incidents which have impact on patients.

With the development of Advanced Incident Reporting System (AIRS) version 2 in 2004, the underlying causes that are currently in use in the MIRP will be further classified to different groups/types of causes, with adaptation from the dataset of the contributory factors of AIRS developed by the AIRS core group. This will facilitate further root cause analysis when required.

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Figure 1. Medication Incidents reported by severity

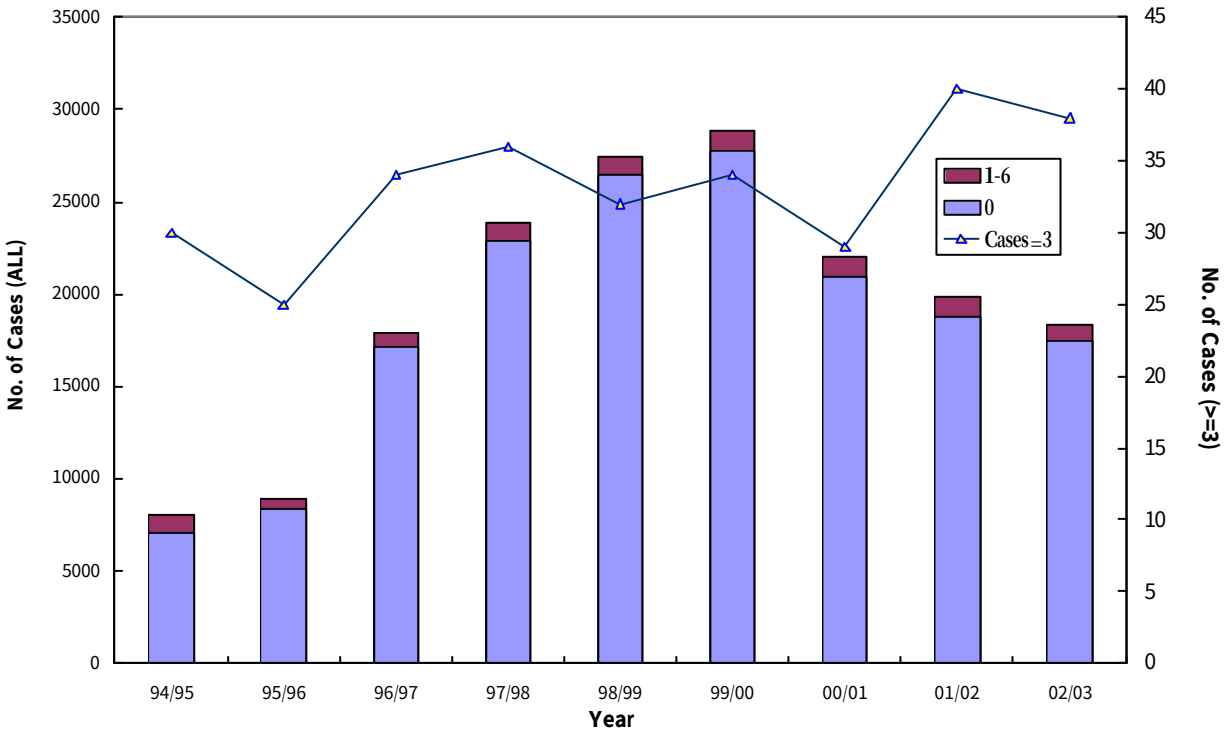


Figure 2. 10 most frequently reported medications

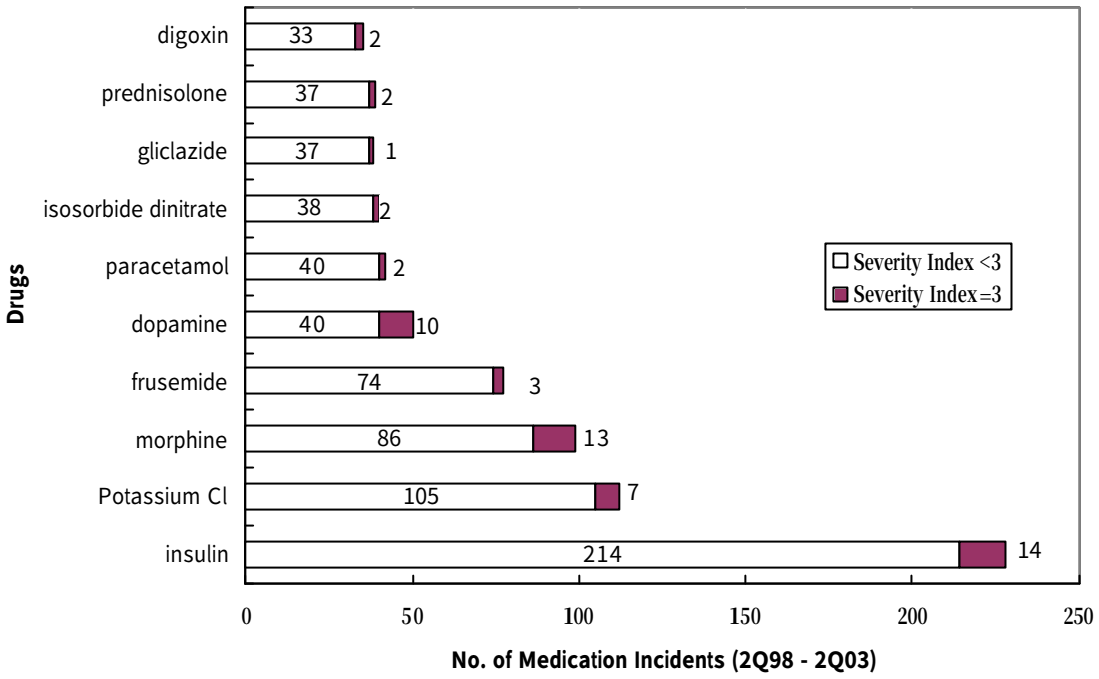


Table 1. Problems associated with the 10 most frequently reported medications (2Q98-2Q03).

Most frequently reported medications			
Drugs	**Top 3 Reported Problems**	**No. of Reports**	**% of total (n=178,273)**
Insulin	Dose omission (71), extra dose (24), wrong dose administered (22)	228	0.13
KCL	Wrong flow rate (25), dose omission (16), wrong patient prescribed (15),	112	0.06
Morphine	Wrong dose administered (20), wrong flow rate (15), dose omission (13)	99	0.06
Frusemide	Extra dose administered (15), dose omission (12), wrong drug dispensed (6), wrong dose admin (6)	77	0.04
Dopamine	Wrong flow rate (16), wrong dose administered (5)	50	0.03
Paracetamol	Dose omission (10), wrong administration time (5), extra dose administered (5)	42	0.02
Isosorbide dinitrate	Wrong flow rate (9), wrong patient administered (5), extra dose administered (4)	40	0.02
Prednisolone	Dose omission (10), wrong dose administered (4)	39	0.02
Gliclazide	Dose omission (8), extra dose administered (7),	38	0.02
Digoxin	Extra dose administered (6), wrong administration time (4), wrong dosage prescribed (4)	35	0.02

Figure 3. Medication Incidents by error type

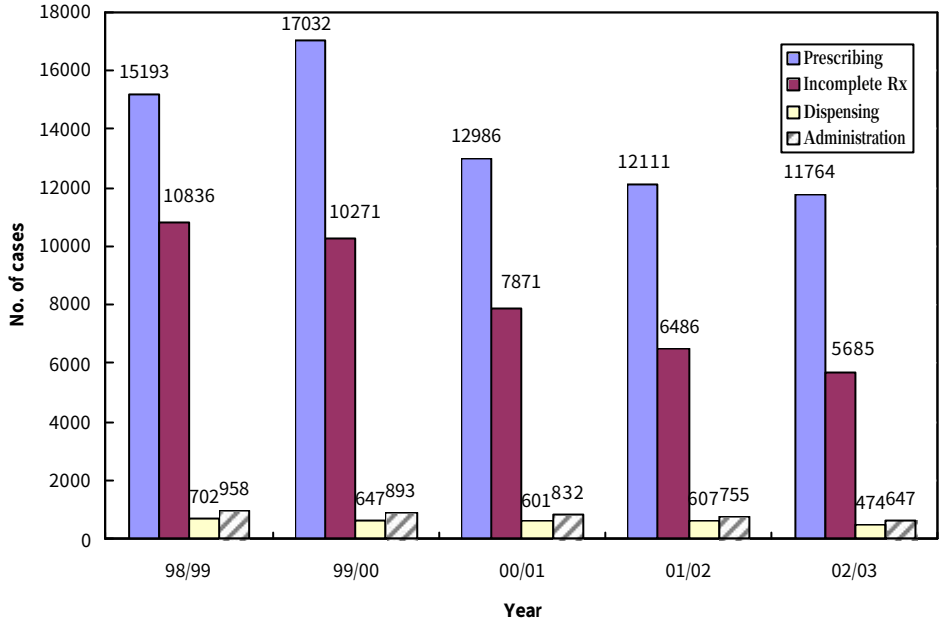
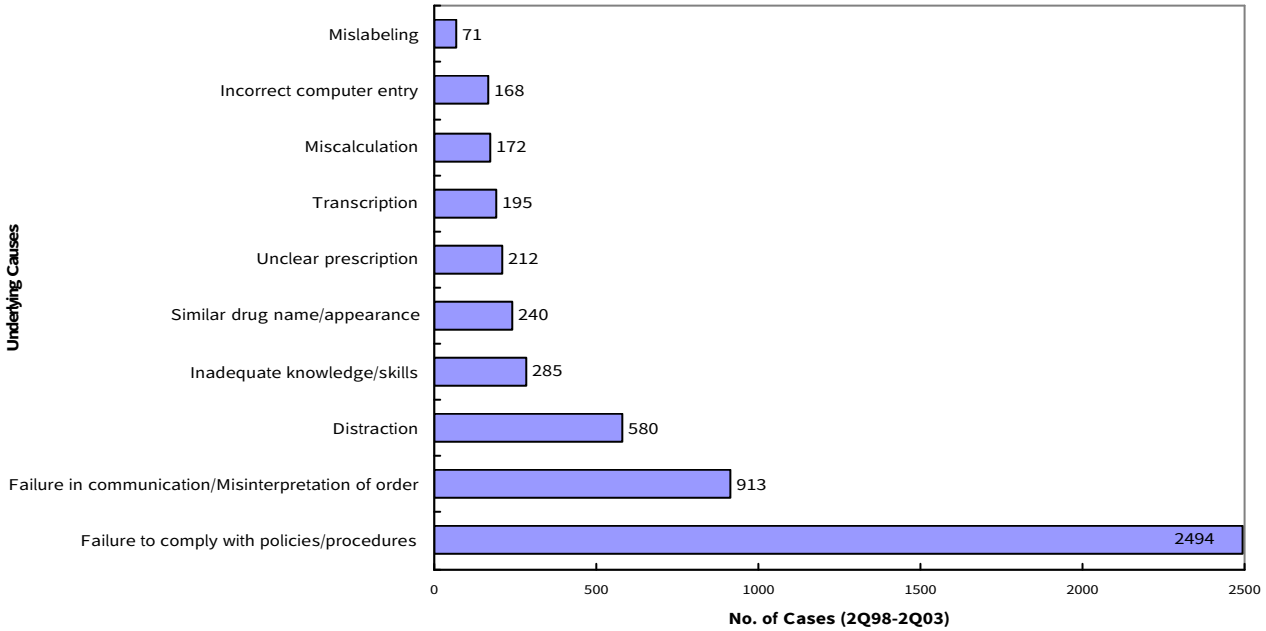


Figure 4. Medication Incidents by top 10 underlying cause



Omission of *propylthiouracil*

Four doses of oral propylthiouracil that required dosage verification were omitted for a patient because the medication had run out in the ward. Thereafter, patient's condition deteriorated and was subsequently transferred to ICU.

Advice

- Doctors, pharmacists and nurses must take that "extra step" to verify an order before a medication is prescribed, dispensed, or administered to a patient. All queried orders must be followed by properly to avoid delay in drug administration or even omission
- Be alert on the serious consequence of non-compliance to administration schedule

Amiodarone overdose

A loading dose of amiodarone 150mg in 100ml D5 over 1h for a patient was mistakenly written on the wrong section of the MAR. However, it was transcribed wrongly as amiodarone 600mg in 500ml D5 over 1h in the area dedicated for stat medications of the MAR. Subsequently, the wrong dosage of amiodarone was given to patient who developed bradycardia and shock.

Advice

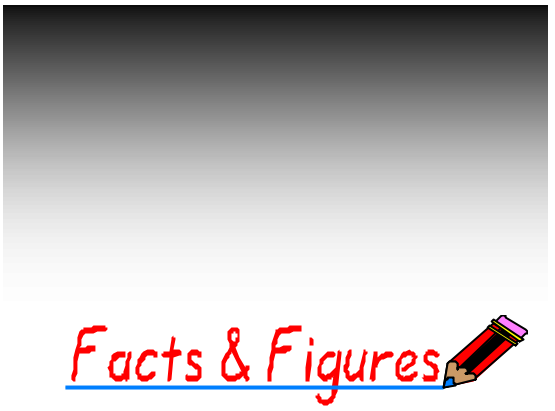
- Staff are consistently exposed to noise, interruptions, and non-stop activities in the working units, as depicted in Fig 4 where distraction was amongst the top 3 underlying cause for MIs.
- Minimise these distractions to help staff remain focused on drug administration process (e.g. overlapping coverage during peak times, division of job responsibilities).

Table 2 Distribution of incidents

	1 Q/2003		2 Q/2003		3 Q/2003	
	Freq.	%	Freq	%	Freq.	%
Distribution of Cases						
In-patient	1412	34.5	1020	34.7	2090	42.5
Out-patient	2684	65.5	1917	65.3	2823	57.5
Initiator of Reporting						
Medical	12	0.3	8	0.3	54	1.1
Nursing	267	6.5	196	6.7	191	3.9
Pharmacy	3814	93.1	2734	93.1	4671	95.0
Others	3	0.1	0	0	0	0
Staff Involved						
Medical	3855	91.6	2690	90.7	4635	92.2
Nursing	244	5.8	124	4.2	261	5.2
Pharmacy	106	2.5	145	4.9	125	2.5
Others	4	0.1	7	0.2	4	0.1
Patient Outcome						
Patient related	208	5.1	152	5.2	175	3.6
Non-patient related	3888	94.9	2785	94.8	4738	96.4

Table 3 Medication incidents by type

	1 Q/2003		2 Q/2003		3 Q/2003	
	Freq.	%	Freq.	%	Freq.	%
Prescribing Error						
Wrong Drug	272	10.5	200	11.1	404	11.7
Wrong Dosage form	158	6.1	131	7.3	180	5.2
Wrong Strength/Dosage	821	31.6	503	28.0	972	28.2
Wrong Duration	216	8.3	210	11.7	436	12.7
Wrong Frequency	363	14.0	258	14.4	577	16.7
Wrong Route	29	1.1	24	1.3	88	2.6
Wrong Abbreviation	27	1.0	7	0.4	19	0.6
Wrong Instruction	169	6.5	107	6.0	178	5.2
Wrong Patient	73	2.8	31	1.7	41	1.2
Double Entry	70	2.7	38	2.1	76	2.2
Drug Omission	49	1.9	36	2.0	84	2.4
Others	352	13.5	249	13.9	391	11.3
Rx Incompleteness						
Missing Drug Name	47	3.7	34	3.5	50	3.9
Missing Dosage Form	88	6.9	53	5.4	45	3.5
Missing Drug Strength	248	19.4	156	16.0	118	9.3
Missing Duration/Quantity	184	14.4	66	6.7	130	10.2
Missing Frequency	173	13.5	146	15.0	234	18.4
Missing Dose	60	4.7	54	5.5	41	3.2
Missing Dr. Signature	102	8.0	111	11.4	148	11.7
Others	377	29.5	355	36.4	503	39.6
Dispensing Error						
Wrong Drug	45	40.9	39	41.5	51	42.1
Wrong Dosage form	12	10.9	7	7.4	8	6.6
Wrong Strength/Dosage	19	17.3	17	18.1	24	19.8
Wrong Quantity	8	7.3	6	6.4	5	4.1
Wrong Patient	9	8.2	7	7.4	7	5.8
Wrong Label Information	11	10.0	11	11.7	15	12.4
Double Dispensing	0	0	1	1.1	1	0.8
Drug Omission	3	2.7	1	1.1	1	0.8
Others	3	2.7	5	5.3	9	7.4
Administration Error						
Wrong Drug	14	10.3	10	10.4	17	15.2
Wrong Dosage form	2	1.5	2	2.1	0	0
Wrong Dose	16	11.8	8	8.3	18	16.1
Wrong Flow rate	10	7.4	3	3.1	8	7.1
Wrong Patient	10	7.4	8	8.3	10	8.9
Wrong Route/Method	3	2.2	4	4.2	3	2.7
Wrong Time	8	5.9	5	5.2	4	3.6
Extra Dose	22	16.2	15	15.6	14	12.5
Dose Omission	36	26.5	27	28.1	26	23.2
Unordered Drug	8	5.9	2	2.1	2	1.8
Others	7	5.1	12	12.5	10	8.9



In the first three quarters of 2003 (Jan-Mar 03, Apr-Jun 03 and July-Sept 03), 4096, 2937 and 4913 medication incidents were reported voluntarily to MIRP, as summarised in Tables 2-6. There was a sudden decrease in the number of incidents during 2Q 2003, which could be attributed to the SARS period and then a sudden increase in 3Q 2003 duration the post SARS period.

"Nil incident to report" were submitted by 2, 3 and 4 hospitals in first three quarters of 2003, respectively. Two hospitals (TMH and TPH) had consistently recorded no return during the reported period from Jan –Sept 2003. The rates of reported MIs in the first three quarters of 03 were 51, 49 and 70 per 100,000 items dispensed respectively.

Table 4 Medication incidents by error type

	1Q/2003		2Q/2003		3Q/2003	
	Freq.	%	Freq.	%	Freq.	%
Prescribing	2599	63.0	1794	60.6	3446	69.6
Incomplete Rx	1279	31.0	975	33.0	1269	25.6
Dispensing	110	2.7	94	3.2	121	2.4
Administration	136	3.3	96	3.2	112	2.3

Table 5 Medication incidents by cause

Underlying Causes	1Q/2003		2Q/2003		3Q/2003	
	Freq.	%	Freq.	%	Freq.	%
Communication failure/misinterpretation of order	26	0.6	23	0.8	36	0.7
Non-compliance with policies/procedures	258	6.2	149	5.0	212	4.2
Incorrect computer entry	199	4.8	163	5.4	206	4.1
Miscalculation	10	0.2	9	0.3	11	0.2
Mislabelling	1	0	4	0.1	7	0.1
Similar drug name/appearance	53	1.3	24	0.8	41	0.8
Transcription	177	4.2	107	3.6	232	4.6
Distraction	539	12.9	493	16.5	909	18.2
Inadequate knowledge/skills	156	3.7	167	5.6	221	4.4
Lack of supervision	3	0.1	2	0.1	1	0
Complicated dosage regimen	43	1.0	7	0.2	5	0.1
Illegible handwriting	46	1.1	47	1.6	61	1.2
Unclear prescription	36	0.9	11	0.4	34	0.7
Commercial packaging/product labelling	0	0	1	0	0	0
Medicine unavailable	3	0.1	0	0	6	0.1
Storage problem	0	0	3	0.1	1	0
Unknown	2007	48.2	1403	46.9	1385	27.7
Others	610	14.6	380	12.7	1633	32.7

Of the 4096, 2937 and 4913 MIs reported in the first three quarters of 2003 respectively, almost 95% of them were rectified before reaching the patients and over 99% of incidents with no impact on patients.

Table 6 Medication incidents by severity

	1Q/2003	2Q/2003	3Q/2003
		Freq.	
No. of preventive interventions	3888	2785	4738
No. of incidents	208	152	175
Severity Index of incidents			
1	165	115	147
2	34	28	28
3	7	8	0
4	2	1	0
5	0	0	0
6	0	0	0

6= an incident occurred that resulted in patient death
5= patient received medication incorrectly and sustained permanent injury
4= patient injured by the error and required either antidote to reverse the process or transferred to a higher level of care
3= patient required increasing monitoring with a change in vital sign as a result of the incident but no ultimate injury
2= patient required increasing monitoring as a result of the incident but no change in vital sign and no patient injury
1= incident occurred that did not result in patient injury