Appendix 2 – Additional tables
## Analysis of ADC transaction logs

### Table A – Controlled Drugs – Time from removing a dose from ADC (‘issue’) to documenting waste (ADC transaction logs, 26 March – 30 June)

| Drug (Controlled) | Issue Transactions | Waste Transactions | Waste Concurrent with Issue | Waste by Separate Transaction to Issue |
|-------------------|--------------------|--------------------|----------------------------|----------------------------------------|
|                   | n                  | n                  | % of Issued                | n | % of Total Waste | Average Time | Range Min | Range Max | <10m | 10m - 1hr | 1hr - 24hr | >24 hr |
| Bupivacaine + Fentanyl | 9                  | 3                  | 33.3%                      | 3 | 100.0%          | n/a          | n/a       | n/a       | n/a | n/a       | n/a       | n/a     |
| Clobazam          | 150                | 52                 | 34.7%                      | 46 | 88.5%           | 6 | 11.5%     | 0:29:06   | 0:00:30   | 2:48:54   | 5            | 1        |
| Clonazepam        | 2                  | 2                  | 100.0%                     | 1 | 50.0%           | 1 | 50.0%     | 0:01:57   | 0:01:57   | 0:01:57   | 1            |
| Diazepam          | 156                | 57                 | 36.5%                      | 48 | 84.2%           | 9 | 15.8%     | 0:22:46   | 0:00:20   | 3:18:01   | 8            | 1        |
| Fentanyl          | 640                | 390                | 60.9%                      | 326 | 83.6%           | 64 | 16.4%     | 2:37:09   | 0:00:17   | 84:12:10 | 44           | 4        | 15       |
| Ketamine          | 229                | 194                | 84.7%                      | 110 | 56.7%           | 84 | 43.3%     | 4:17:27   | 0:00:23   | 84:12:55 | 10           | 10       | 63       |
| Midazolam         | 765                | 593                | 77.5%                      | 495 | 83.5%           | 98 | 16.5%     | 0:55:14   | 0:00:15   | 9:25:36   | 56           | 16       | 26       |
| Morphine Hydrochloride | 75          | 49                 | 65.3%                      | 44 | 89.8%           | 5 | 10.2%     | 0:00:36   | 0:00:14   | 0:00:54   | 5            |
| Morphine Sulfate  | 325                | 237                | 72.9%                      | 195 | 82.3%           | 42 | 17.7%     | 4:28:15   | 0:00:19   | 172:00:21 | 37           | 1        | 3        | 1        |
| Morphine Sulfate MR | 57            | 49                 | 86.0%                      | 43 | 87.8%           | 6 | 12.2%     | 0:01:30   | 0:00:18   | 0:06:27   | 6            |
| Oxycodeone        | 32                 | 25                 | 78.1%                      | 24 | 96.0%           | 1 | 4.0%      | 0:00:31   | 0:00:31   | 0:00:31   | 1            |
| Phenobarbital     | 31                 | 17                 | 54.8%                      | 15 | 88.2%           | 2 | 11.8%     | 0:02:33   | 0:01:01   | 0:04:05   | 2            |
| Phenobarbitone    | 1                  | 0                  | 0.0%                       | 0 | n/a             | n/a | n/a       | n/a       | n/a       | n/a       | n/a          |
| Propofol          | 157                | 12                 | 7.6%                       | 2 | 16.7%           | 10 | 83.3%     | 6:25:49   | 0:55:18   | 16:03:49 | 2            | 8        |
| Thiopentone       | 3                  | 1                  | 33.3%                      | 1 | 100.0%          | 0 | n/a       | n/a       | n/a       | n/a       | n/a          |
| Total *           | 2632               | 1681               | 63.9%                      | 1353 | 80.5%           | 328 | 19.5%     | 2:40:26   | 0:00:14   | 172:00:21 | 175           | 33       | 117      | 3        |

* Not including the controlled drug in the fridge – accessed by generic ‘fridge item’ in the ADC and documented in registries
Analysis of data from audits of registries of controlled drugs

Table B. Frequency of documentation inaccuracies in controlled drugs registries in the ICU and control wards (January – June 2019)

| Type of documentation inaccuracy                   | ICU n (%) (doses*: 5783) | Oncology n (%) (doses*:2930) | Orthopaedics n (%) (doses*:3750) |
|---------------------------------------------------|---------------------------|-------------------------------|----------------------------------|
| Asterisks representing corrections to the register| 305 (5.3%)                | 132 (4.5%)                    | 282 (7.5%)                      |
| Calculation errors identified by nurses or pharmacists | 9 (0.2%)                 | 3 (0.1%)                      | 48 (1.3%)                       |
| Other (e.g. balance changed incorrectly)         | 3 (0.1%)                  | 1 (0.0%)                      | 9 (0.2%)                        |
| Missing amounts (given, discarded, balance)      | 47 (0.8%)                 | 26 (0.9%)                     | 20 (0.5%)                       |

% are calculated on number of doses. * The number of doses is the number of entries documented in registries – i.e. number of times medications have been recorded as given (or not) to patients. The table does not include data about discrepancies, reported in a separate table.

Table C. CD discrepancies (losses and gains) in the ICU and control wards in the study period (January – June 2019)

|                         | ICU (*) [pre/post ADC n (%)] | Oncology [no ADC in use] n (%) | Orthopaedics [no ADC in use] n (%) |
|-------------------------|------------------------------|---------------------------------|-----------------------------------|
|                         | (doses*: 5783)               | (doses*:2930)                   | (doses*:3750)                     |
| Discrepancies identified by nurses/pharmacists | 54 (0.9%)                   | 11 (0.4%)                       | 37 (1.0%)                         |

(*) Limited to discrepancies identified in registries (excluding discrepancies in ADC). % are calculated on number of doses. * The number of doses is the number of entries documented in registries – i.e. number of times medications have been recorded as given (or not) to patients.
Comparative analysis of data from audits of controlled drugs registries and ADC transaction logs

**Table D. CD discrepancies (losses and gains) in the ICU and control wards in the three months before and after ADC implementation (as recorded in registries and ADC transactions logs)**

|                         | Jan-March 2019 [pre-ADC] * | April – June 2019 [post-ADC] |
|-------------------------|-----------------------------|-----------------------------|
|                         | n of doses | Losses | Gains | n of doses | Losses | Gains |
| **ICU**                 |            |        |       |            |        |       |
| Medications in bottles  | 1597       | 15     | 1     | 2273       | 30     | 6     |
|                         |            | (0.94%)| (0.06%)|            | (1.32%)| (0.26%)|
| Medications in unit doses| 1792       | 2      | 0     | 121        | 0      | 0     |
|                         |            | (0.40%)|       | [in registries] |      |      |
|                         |            |        |       | 7366 (*) | 15     | 14    |
|                         |            |        |       | [in ADC]  |        |       |
| **Oncology [no ADC in use]** |            |        |       |            |        |       |
| Medications in bottles  | 336        | 4      | 0     | 409        | 5      | 2     |
|                         |            | (1.19%)|       |            | (1.22%)| (0.49%)|
| Medications in unit doses| 1045       | 0      | 0     | 1140       | 0      | 0     |
| **Orthopaedics [no ADC in use]** |            |        |       |            |        |       |
| Medications in bottles  | 1123       | 19     | 1     | 1031       | 14     | 2     |
|                         |            | (1.42%)| (0.09%)|            | (1.36%)| (0.19%)|
| Medications in unit doses| 889        | 0      | 0     | 707        | 0      | 0     |
