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To: ACAMAID Listserve

## Update on Aid-in-Dying Pharmacology

Acronym scorecard:

D-DMAPh. 100mg of digitalis 30 minutes before diazepam 1gm, morphine 15gm, amitriptyline 8gm, phenobarbital 5gm.

DDMAPh: As above, but all medications given together in one dose.

All,

Thank you to those who are [submitting your aid-in-dying death data](#) to the Academy — your information is extremely helpful to our continued understanding of the present pharmacology recommendations. We have now analyzed data on 170 patients using the added phenobarbital protocols: 33 D-DMAPh, 137 DDMAPh.

Summary of findings:

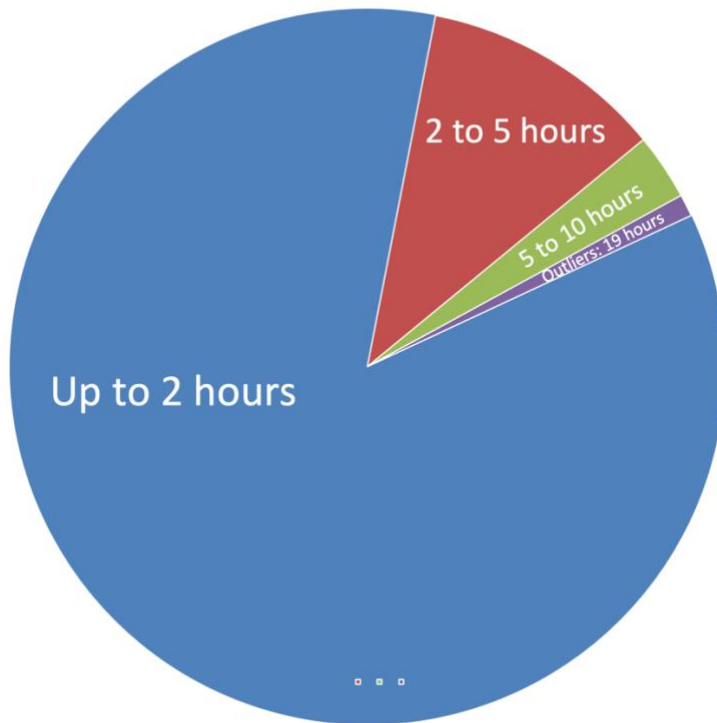
Regimens with added phenobarbital continue to be a major improvement to all prior protocols. D-DMAPh (1.06-hour average) may be slightly superior to DDMAPh (1.23-hour average), but the clinical significance is negligible. For simplicity of administration, DDMAPh continues to be the protocol of choice.

85% of patients now have times to death of 2 hours or less. The 15% of deaths that exceeded 2 hours varied from 2.5 hours to a rare 3% of all cases at >5 hours (max of 10 hours). Of these, pre-ingestion gut dysfunction was common (including nausea or vomiting before ingestion).

Rectal medications, used in 15% (25/170) of all reported deaths: 96% of these patients had times to death of 2 hours or less. With these smaller numbers, the statistical improvement over oral deaths is debatable. But we can be sure that the timing of rectal deaths is not clinically inferior to deaths by oral administration.

Brief statistical/procedural note: 5 cases of 175 were eliminated from the data used to calculate averages, because they were extreme outliers ([this is a common statistical technique](#)). Two were reported as 1-minute deaths, and I have no idea what to make of those. Three were long-death extreme outliers at around 19 hours. Of note is that two of these three deaths had readily apparent gut absorption abnormalities. One was a rare genetic gut disorder requiring a colostomy. The other drank a smoothie soon before medication ingestion (proving that fat and fiber in proximity to ingestion can delay absorption). The third long case, a patient with a brain tumor, had no apparent explanation. Of note is that none of these three patients showed signs of agitation or awakening before they died, i.e. **complete, lasting anesthesia was obtained in 100% of 175 cases.**

DDMAPh Times to Death: 175 patients



The moral of this story:

- Treat all gut abnormalities, even just persistent nausea, as serious risks for prolonged deaths.
  - Treat pre-aid-in-dying nausea aggressively, possibly including dexamethasone (4 to 8mg/day) for the 48-hours preceding death.
  - Treat end-of-life constipation seriously, it can delay gastric emptying.
  - Keep the patient NPO except for small amounts of clear liquids for at least 8 hours prior to oral ingestion.
- Rectal medications are as efficient as oral medications. They should be used if clinically feasible and the oral route or upper-GI tract is compromised.
- Extreme outliers are rare and often predictable, mostly from GI-tract dysfunction.

**What to tell patients and their families about the aid-in-dying day:** This is probably the most significant information we've learned from our data collection. *All patients and their families should be properly advised of potential times to death to avoid any surprises, confusion, or unrealistic expectations.*

- There is an 85% chance of death within 2 hours of medication ingestion.

- Longer deaths will vary from 2 to 5 hours (12% of all cases), and 5 to 10 hours (3% of all cases). Patients will remain comfortably unconscious throughout these times.
- Extreme outliers, up to 20 hours, are possible, but highly unusual (about 1 of 100 patients). *Even for these patients, comfortable anesthesia is maintained until death, and nothing needs to be done other than to wait.*

Please continue to submit your aid-in-dying data at <https://www.acamaid.org/datareport/>. And if you haven't yet been doing so, we encourage and welcome you to do so.

On a more philosophical note: As long as aid-in-dying clinicians are required to work with the gastrointestinal tract and all injections are prohibited, it is unlikely that further pharmacologic advances will improve our average times to death or bring in the occasional outliers. The rate-limiting step is no longer the pharmacology, but rather the imperfections of gut absorption of medications. Further improvements, then, are more a political than a pharmacological question.

That's all, folks. We welcome all thoughts, suggestions, and questions.

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American Clinicians Academy on Medical Aid in Dying

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