Alternate Routes of Medication Administration for End of Life Symptom Management

CHOOSING THE RIGHT ROUTE AT THE END OF LIFE - COMPARING EFFECTIVENESS, VERSATILITY, COST, AND EASE OF USE IN THE HOME SETTING

Brad Macy RN, BA, BSN, CHPN
Potential Conflict of Interest Statement

I am a co-founder of Hospi Corporation and the inventor of the Macy Catheter. I may benefit financially from sales of the Macy Catheter, which is discussed in this presentation.
Outline

1. Current Challenges with Symptom Management
2. Analyzing Current Standards of Practice at Home
3. Identifying the Best Alternative Route
4. Various Routes of Medication Delivery
5. Comparing Alternate Routes of Delivery
Symptom Management

How are we doing?

- **Kehl et al. (2013)** – Large lit review - dyspnea (56.7%), pain (52.4%), respiratory secretions/death rattle (51.4%), and confusion (50.1%) \[1\]
  - Doing better than this but have room for improvement

- **SUPPORT Study (1998)** - >80% patients reported the desire to die at home – only 50% died at home [2]

- **NHPCO Facts and figures (2013-2014) \[3,4\]**
  - GIP days increased from 2.2% (2011) to 2.7% (2012) to 4.8% (2013) – (>100% increase)
  - >33% of hospice patients still dying in an inpatient facility
Symptom Management

- Institute of Medicine Report - State of End of Life Care in America (2014)[5]

  - Patients not dying in the environment of choice
  - “Falling short of our goals of providing end of life care based on the needs, values and preferences of our patients”
  - Spending too much for end of life care
    - Of the > 1.5 million hospice patients:
      - 1/3rd die in inpatient at ~$700 per day
      - 2/3rd die in home setting at ~$160 per day
Typical Home Hospice End of Life Scenario:

- The oral route fails for a patient who wishes to die comfortably at home
  - Most oral medications stopped (except SL morphine, lorazepam, atropine)
  - For many patients this is all that is needed
  - Not adequate for complex symptom management patients
- When symptoms worsen
  - Many commonly utilized alternate medication routes or formulations often do not work well
    - Transdermal, Sublingual, tablets given PR
Analyzing Current Standards of Practice

- **When alternative routes fail**
  - Symptoms continue to worsen
  - Patient continues to suffer
  - Family/CG are burdened significantly

- **Placement in Higher Acuity Setting**
  - Often more invasive and costly medication options are utilized
  - Patient loses choice of environment of death
Many medications stopped in last days
- Typically revert to sublingual-only meds
  - Morphine
  - Ativan
  - Atropine
- These work well in low volumes - mild to moderate symptoms.
- For more severe symptoms another route must be considered proactively
Issues with Current Standards of Practice

Medications many times stopped - need careful consideration

- NSAID’s
  - Bone, inflammatory pain, fever
- Antiepileptics
  - Rebound seizures, neuropathic pain, withdrawal (phenobarbital, valium, clonazepam)
- Anti-depressants
  - Withdrawal, neuropathic pain
- Steroids
  - Metabolic disturbances, return of numerous symptoms including pain (Liver, Bone, Inflammatory) dyspnea, fever, nausea and vomiting, seizures, bowel obstruction
Analyzing Current Standards of Practice

Use of potentially ineffective transdermal route

Transdermal Gels

- Avoid compounding for systemic drugs
- Skin is very effective barrier for chemical penetration
- No evidence base – most drugs
- Growing evidence - no efficacy
  - Decreased peripheral circulation – decreased bio-availability
  - NSAIDs – some work locally, little systemic absorption
  - Ativan, Benadryl and Haldol Gel Study- Very little absorption [6]
Use of Sublingual Route

- SL excellent route for continuing low dose morphine, lorazepam, atropine only
  - Very few drugs actually absorb sublingually
    - Morphine (9% - 51% bio-availability)[7]
    - Ativan
    - Atropine (variable absorption)[8]
    - Intensols – These are NOT sublingual
  - Copious oral secretions inhibit absorption
  - Large volumes will not stay under tongue
    - May be swallowed
    - Silent aspiration with larger volumes - adds to respiratory distress
    - Crushing tablets = (bad taste + unlikely absorption + aspiration risk)
Use of Tablets or Capsules Rectally

- Rectum is dry, especially near death
  - Dry tablets = difficulty dissolving = Decreased T-max and C-max
  - Unable to spread over rectal mucosa without water
  - Lubricating jelly adds very little water
  - Increased burden of care - Caregivers usually don’t like giving suppositories much less pills

- Literature shows micro-enemas tend to absorb better than suppositories\cite{9,10}
Identifying the Best Alternative Route(s)

What is the best alternative route?

- Scenario: The oral route fails for a patient who wishes to die comfortably at home.

  - Answer depends on the patient's wishes, active symptoms, and symptom history.
  - Ongoing assessment / proactive planning key to good transition
    - Does the patient wish to die at home?
    - What is the history of symptom types and their severity
    - Will patient experience withdrawal if any medications are stopped?
    - Is the patient on high doses of opioids?
    - Are adjuvants for pain and symptom control being utilized?

- Based on this assessment decide;
  - Which medications should be stopped and which continued?
Identifying the Best Alternative Route(s)

- **An optimal route would have these qualities**
  - **Clinical Effectiveness** - Evidence base for effectiveness
  - **Easy Use** - Home Setting
    - Easy for caregivers
    - Comfortable and safe
    - Rapid initiation and availability
    - Minimum supply coordination.
Identifying the Best Alternative Route(s)

- A optimal route would also be:
  - **Versatile** - All medications needed could be given via this route - scheduled and break through dosing
  - **Cost Effective** - Low comparative cost
    - Not always obvious
      - Per diem pharmacy costs
      - Delivery costs
      - Supply costs
      - Nursing time to implement and problem solve
Alternate Routes of Medication Delivery

- **Sublingual**
  - **Benefits**
    - Easy,
    - Comfortable,
    - Low cost
  - **Downsides**
    - Limited medications
    - Limited surface area
    - Copious secretions inhibit absorption
    - Limited dose volume - potential aspiration
Alternate Routes of Medication Delivery

- **IV**
  - **Benefits**
    - Fast (once placed)
    - Very Effective
    - Versatile medications
  - **Downsides**
    - High CG burden
    - Difficult/delayed access to supplies/meds
    - High cost
    - Some limited medications (NSAIDS)
    - Higher complications
Alternate Routes of Medication Delivery

- **SQ**
  - **Benefits**
    - Usually fast (once placed)
    - Usually effective
    - Mostly comfortable
  - **Downsides**
    - Difficult/delayed access to supplies/meds
    - High cost
    - Limited medications
    - Higher complications
    - <SQ fat-wasting
    - Higher CG Burden
    - Decreased peripheral circulation at EOL
Alternate Routes of Medication Delivery

- **Transdermal**
  - **Benefits**
    - Easy
    - Comfortable
  - **Downsides**
    - Poor absorption
    - Delayed/difficult access (compounding/delivery issues)
    - Moderate cost
    - Very Limited medications
    - Decreased peripheral circulation EOL
    - No break through dosing potential
Alternate Routes of Medication Delivery

- **Intranasal**
  - **Benefits**
    - Very rapid onset
    - Easy
    - Comfortable
  - **Downsides**
    - High cost
    - Very limited drugs
    - Buildup of residue
Alternate Routes of Medication Delivery

• Rectal (Suppositories)
  ○ Benefits
    - High medication versatility
    - Effective absorption most meds used at end of life\(^4\)
    - Some are inexpensive
    - Less CG education
  ○ Downsides
    - Higher CG Burden
    - Uncomfortable (requires repeated movement)
    - Ongoing invasion of privacy
    - Low dose versatility – usually one drug, one dose
    - Availability and cost if specially compounded
    - Time to onset of effect
An Emerging Alternate Route

Rectal micro-enema (Macy Catheter)

- Device placed by the clinician
- Medication port on leg or abdomen
- Discreet delivery of medications in suspension via syringe to rectal mucosa
- Oral medications crushed and suspended or dissolved in water
- Stays in place for ongoing medication administration
- Small, soft balloon defecated when patient has bowel movement (or removed prior to)
Rectal micro-enema (Macy Catheter)

- **Benefits**
  - High medication versatility
  - Effective absorption most meds used at end of life\(^8\)
  - Easy, Comfortable
  - Utilizes oral medications
  - Discreet, no caregiver invasion of privacy
  - Quick alternative – no compounding

- **Downsides**
  - Moderate Device Cost
  - Device is expelled with defecation
  - Nurse needs to reinsert
Comparing Alternate Routes of Delivery

<table>
<thead>
<tr>
<th>Medication Versatility</th>
<th>Rectal</th>
<th>SQ</th>
<th>IV</th>
<th>SL</th>
<th>Transdermal</th>
<th>Intra-nasal</th>
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</thead>
<tbody>
<tr>
<td><strong>Opiates</strong> - (Morphine, fentanyl, Hydromorphone, methadone, more)</td>
<td>X</td>
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<td>Fentanyl</td>
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<td><strong>NSAIDS</strong> - (Ibuprofen, Indomethacin, ASA, Ketoprofen)</td>
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<td><strong>Benzodiazepines</strong> (Lorazepam, Diazepam, Midazolam, Clonazepam)</td>
<td>X</td>
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<td>Ativan</td>
<td>Midazolam</td>
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<td><strong>Antinauseants</strong> - (Metoclopramide, Prochlorperazine, Odansetron, promethazine)</td>
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<td><strong>Anti Seizure</strong> - (Valproic Acid, Carbamazepine)</td>
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<td><strong>Sedatives</strong> - (Phenobarbital, Pentobarbital, Ativan)</td>
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<td><strong>Anti-depressants</strong> - (Trazadone, Doxepin, Imipramine, Clomipramine)</td>
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<td><strong>Neuroleptics</strong> - (Haldol, Thorazine)</td>
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<td><strong>Anti-cholinergics</strong> - (Atropine, Dimenhydrate, Oxybutinin)</td>
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<td><strong>Antibiotics</strong> - (Amoxicillin, Erythromycin, Metronidazole, Fluconizole)</td>
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Pharmacokinetic studies have been done on the above drugs. Absorption has been found to be effective in the routes marked in green. For specific absorption via rectal route, see Davis et al. (2002)[8]
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- **Green** - Easy and Effective for Break Through (Immediate) Symptom and ongoing Symptom Control
- **Yellow** – More difficult for Immediate and/or ongoing Symptom Control
- **Red** – Not effective for immediate symptom control
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- **Green** - 80%+ drug classes listed (slide 24) have drugs effective via route
- **Yellow** - 50% drug classes listed have drugs effective via route
- **Red** - 20% or less of drug classes listed have drugs effective via route
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- **Green** - Minimal Training, Easy set up, non-sterile, comfortable for CG/Pt., low complications
- **Yellow** - Minimal Training, uncomfortable for CG/Pt., repeated invasiveness
- **Red** - Greater training needs, delivery/supply management, sterile technique, more complications
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Cost:
- $ ~ $10 dollars/day
- $$ ~ $20 dollars/day
- $$$ ~ $50 dollars/day
- $$$$$ ~ $100/day
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Review - Planning a Good Patient-centric Death

1. Provide ongoing assessment and proactive care-planning
   • Identify which meds can be stopped and which continued

2. Avoid symptom crises that lead to loss of patient choices and increased caregiver burden.
   • Quickly respond to symptom return
   • Consider adding back adjuvants

3. Choose the medication route that meets the needs and wishes of the patient in the easiest, most versatile, and most cost effective way possible.

Cooper J. *Stepping into palliative care; a handbook for community professionals*; Radcliffe Press; 2000; Chapter 7: 105-116.


Coyne PJ, et al. Compounded Drugs – Are customized prescription drugs a salvation, snake oil or both? *Journal of Hospice and Palliative Nursing* 2006;8:222-226

Related References


Web References and Resources