Transitioning Inpatient Chemotherapy to the Outpatient Setting

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- Consultant: Hospira, Sandoz
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Off-Label Use Disclosure(s)

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Objectives

Review process implementation for managing transition of inpatient chemotherapy to the outpatient setting

Summarize metrics for evaluating outcomes for transitioning to outpatient chemotherapy
Question #1

Which of these chemotherapy regimens would you consider for routine inpatient chemotherapy?

1. FOLFOX
2. Gemcitabine + Nab-Paclitaxel
3. Gemcitabine + Oxaliplatin
4. R-EPOCH
5. R-ESHAP
Why Transition Chemotherapy to the Outpatient Setting?

Cost of chemotherapy
- Inpatient/Outpatient Billing

Inpatient bed crunch
Patient assistance programs
Billing for waste
Patient satisfaction
Cost of Chemotherapy

Drug Expenditure Costs 2006-2015

## Drug Expenditures in 2015

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Antineoplastic agents</td>
<td>17.23</td>
<td>Antineoplastic Agents</td>
<td>5.85</td>
<td>Infliximab</td>
<td>1.04</td>
</tr>
<tr>
<td>Blood Factors</td>
<td>7.24</td>
<td>Hemostatic Modifiers</td>
<td>3.07</td>
<td>Rituximab</td>
<td>1.01</td>
</tr>
<tr>
<td>Biologicals</td>
<td>6.01</td>
<td>Antiinfectives, systemic</td>
<td>2.72</td>
<td>Pegfilgrastim</td>
<td>0.85</td>
</tr>
<tr>
<td>Gastrointestinal agents</td>
<td>4.36</td>
<td>Blood Factors</td>
<td>2.03</td>
<td>Immune globulin</td>
<td>0.83</td>
</tr>
<tr>
<td>Antiviral agents</td>
<td>2.48</td>
<td>Biologicals</td>
<td>1.85</td>
<td>Alteplase</td>
<td>0.73</td>
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<tr>
<td>Immunologic agents</td>
<td>2.03</td>
<td>Gastrointestinal agents</td>
<td>1.82</td>
<td>Natalizumab</td>
<td>0.7</td>
</tr>
<tr>
<td>Ophthalmic Preparations</td>
<td>1.87</td>
<td>Immunologic agents</td>
<td>1.49</td>
<td>Daptomycin</td>
<td>0.64</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1.83</td>
<td>Antiviral drugs</td>
<td>1.3</td>
<td>Bevacizumab</td>
<td>0.62</td>
</tr>
<tr>
<td>Musculoskeletalal agents</td>
<td>1.57</td>
<td>Hospital Solutions</td>
<td>1.19</td>
<td>Pneumococcal vaccine</td>
<td>0.62</td>
</tr>
<tr>
<td>Hemostatic modifiers</td>
<td>1.52</td>
<td>Respiratory Therapy Agents</td>
<td>1.13</td>
<td>Trastuzumab</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Cost for an Inpatient Bed Stay

United States

1. State/local government hospitals — $1,878
2. Nonprofit hospitals — $2,289
3. For-profit hospitals — $1,791

Arizona

State/local government hospitals — $2,089
Non-profit hospitals — $2,474
For-profit hospitals — $2,035

# Inpatient versus Outpatient Reimbursement

<table>
<thead>
<tr>
<th>INPATIENT REIMBURSEMENT</th>
<th>OUTPATIENT REIMBURSEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient chemotherapy, often considered a financial loss</td>
<td>Based on a “Buy and Bill” philosophy</td>
</tr>
<tr>
<td>Payment falls under DRG*</td>
<td>Eligible institutions may be able to purchase therapies under 340B</td>
</tr>
<tr>
<td>Lack of reimbursement with high-cost therapies</td>
<td>Charging for waste</td>
</tr>
<tr>
<td>Inability to bill for waste</td>
<td>Patient assistance programs</td>
</tr>
<tr>
<td>Inability to access patient assistance for patients</td>
<td></td>
</tr>
</tbody>
</table>

* Diagnosis-Related Group
Comparison of Advantages between Outpatient and Inpatient Chemotherapy Administration

<table>
<thead>
<tr>
<th>Advantages of Outpatient Chemotherapy</th>
<th>Advantages of Inpatient Chemotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows for safe, easy drug administration</td>
<td>Critical management of patients during chemotherapy who may need or require constant monitoring during and post-treatment</td>
</tr>
<tr>
<td>Respects patient’s wish to avoid hospitalization</td>
<td>Induction chemotherapy for acute leukemia patients</td>
</tr>
<tr>
<td>Familiar and “safe” facility enhances patient’s physical comfort and psychological well-being</td>
<td>Care of services for autologous and allogeneic transplant patients</td>
</tr>
<tr>
<td>Oncologist has direct and immediate control of drug administration</td>
<td>Co-existing medical problems that may require critical monitoring</td>
</tr>
<tr>
<td>Assistance immediately available if problems arise</td>
<td>Complex chemotherapy regimens that may require pharmacokinetic evaluation</td>
</tr>
<tr>
<td>Decreased overall costs compared to inpatient chemotherapy administration</td>
<td>High-dose methotrexate protocols for leukemia, lymphoma, and sarcoma</td>
</tr>
<tr>
<td>Overnight stay avoided (utilization of long-acting CINV prophylaxis, infusion of chemotherapy with home infusion pumps, provisions for mesna infusions at home with ifosfamide chemotherapy orders).</td>
<td>Investigational drug treatments/protocols requiring prolonged pharmacokinetic monitoring</td>
</tr>
<tr>
<td>Facilitates “tracking” and control of treatment costs</td>
<td></td>
</tr>
<tr>
<td>Increased access to patient assistance programs, which may decrease out-of-pocket expenses for outpatient chemotherapy, labs, and support for housing</td>
<td></td>
</tr>
</tbody>
</table>
Justification for Hospitalization for Chemotherapy

1. High-dose cisplatin (75 mg/m² or more)
2. “Special procedure” chemotherapy
3. Induction therapy for acute leukemia
4. Stem cell/bone marrow transplantation with high-dose chemotherapy
5. “High-dosage chemotherapy”
6. Severely emetogenic chemotherapy
7. Ifosfamide therapy
8. Initial dose of chemotherapy while hospitalized
9. High-dose methotrexate protocols
10. If chemotherapy administration is mandatory despite comorbidities

Dollinger M. Guidelines for Hospitalization for Chemotherapy. The Oncologist. 1996. 1:107-111
Comments Received from Patients Receiving Chemotherapy Inpatient

I get no sleep when I am admitted so I hate staying inpatient.

I waited eight hours for a bed to get admitted and start chemotherapy the next day.

I have a line attached to my arm for two days for only three days of chemotherapy, why can’t I do this outpatient?

I have kids so I do not have the time for an inpatient stay.

The list goes on and on.
Developing a Practice Model for Implementation
Evaluating High-Cost Inpatient Therapies

1. Developed weekly meetings with pharmacy leadership
2. Evaluated trends for inpatient and outpatient chemotherapy
3. Tied this in with the quarterly cancer center business meetings
Evaluation of High-Cost Chemotherapy

Rituximab/Clofarabine

- Patients did not have access to patient assistance programs
- Drug waste could not be billed in the inpatient setting
- Drug replacement programs were not utilized
- Patients often waited until the next day to start chemotherapy
Evaluated Cost Savings Measures

1. Rituximab
   - Often given inpatient

2. Clofarabine
   - Often given inpatient

3. Outpatient Chemotherapy
   - Published in the literature
   - Used at some institutions
Outpatient Chemotherapy

Lymphoma
AML/ALL
Solid tumor regimens
Transitioning Outpatient Chemotherapy

“Buy-in”
- Physicians/advanced practitioners & fellows need to address OP options
- Nurse coordinators in clinic need to evaluate this content for outpatient treatment
- Financial counselors/finance team needs to address outpatient chemotherapy/patient assistance programs and housing assistance
- Clinical pharmacists need to address patients eligible for outpatient chemotherapy
Implementation for Transitioned Outpatient Chemotherapy

- **November 1, 2013**: Epic Implementation
  - Developed First Outpatient Chemotherapy (Clofarabine)

- **January to March 2014**: Developed Leadership Meetings to Implement Workflow and Develop Order Sets

- **May 1, 2015**: Implemented Outpatient Rituximab Order Sets

- **Continuation**: Builds for Outpatient Chemotherapy Order Sets
Implementation of Transitioning Inpatient Chemotherapy to the Outpatient Setting

- Medical Director
- Physicians/Providers
- Nurse Coordinators
- Oncology Ambulatory Specialists
- Financial Counselors
- Nurse Navigators
- Infusion Center Management
- Staff Pharmacists
- IT Team
- Risk Management
# Implementation of Transitioning Inpatient Chemotherapy to the Outpatient Setting

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Positives</th>
<th>Negatives</th>
<th>Resolution of Workflow Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Director</td>
<td>Increased patient access, decreased admission times for patients with split dose rituximab, decreased inpatient wait times for beds by decreasing overall inpatient chemotherapy orders</td>
<td>Potential issues with patients who may need to stay inpatient for chemotherapy administration</td>
<td>Patients who need assistance are identified with our social workers during chemotherapy discussions for housing assistance and also transport subsidies</td>
</tr>
<tr>
<td>Physicians</td>
<td>Easier to see patients in clinic versus going to the hospital during their stay, less concerns for patient transition of care chemotherapy</td>
<td>Distance for patients, feasibility for patients to attend clinic the next day after discharge, housing issues for long distance patients</td>
<td>We had defined social workers to address housing and also financial counselors working to assist in the process for foundation assistance</td>
</tr>
<tr>
<td>Infusion Nurses</td>
<td>Decreased patient load for inpatient nurses, newer treatment options utilized in the outpatient setting</td>
<td>Concerns over drug administration schedules and safety</td>
<td>Clinical pharmacy staff addressed chemotherapy concerns prior to the start of chemotherapy for monitoring parameters and chemotherapy infusion questions</td>
</tr>
<tr>
<td>Nurse Coordinators</td>
<td>Options for patients who cannot stay inpatient or do not have caregiver support</td>
<td>Timing for outpatient chemotherapy</td>
<td>Patients would be scheduled either the Friday or Saturday prior to start of chemotherapy to prevent delays, and Clinical Pharmacists would address supportive care medication and pharmacy infusion members prior to the start of outpatient chemotherapy</td>
</tr>
<tr>
<td>Risk Management</td>
<td>This would provide increased options of care for patients and increased quality of care and access</td>
<td>None were noted</td>
<td>-</td>
</tr>
</tbody>
</table>
# Implementation of Transitioning Inpatient Chemotherapy to the Outpatient Setting

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<th>Resolution of Workflow Issues</th>
</tr>
</thead>
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<tr>
<td>Clinical Pharmacists</td>
<td>Increased opportunity for clinical education on current chemotherapy, increased access to prevent medication discharge issues with supportive medications, increase adherence to supportive care medications, decrease inpatient drug waste</td>
<td>Increased workload for building chemotherapy regimens in the outpatient setting, support services for pumps were also raised as questions</td>
<td>Clinical Pharmacists increased their role as members of their disease team and addressed patient counseling with the physicians and nurse coordinators to coordinate outpatient care. Chemotherapy orders were developed with all parties for infusion services and pumps, chemotherapy order sets and pumps were counseled on by pharmacists and nurses for pump support during chemotherapy</td>
</tr>
<tr>
<td>Financial Counselors</td>
<td>Increased patient access to medication assistance programs, decreased workload on financial and scheduling approval for inpatient and outpatient treatment regimens, billable drug waste</td>
<td>Required education on new regimens, reimbursement with outpatient pumps</td>
<td>Financial Counselors were notified by the clinical oncology pharmacists when patients were started on outpatient chemotherapy or split dose rituximab regimens to address patient copay support and also outpatient pump charges for infusion</td>
</tr>
<tr>
<td>Staff Pharmacists</td>
<td>Billable drug waste in the outpatient setting, ease of transition for a majority of chemotherapy orders to outpatient</td>
<td>Addressing early start chemotherapy for HiDAC-containing regimens</td>
<td>Infusion center pharmacists were notified of start times for HiDAC containing regimens, cytarabine orders were batched to prevent waste for patients</td>
</tr>
<tr>
<td>IT Epic Team</td>
<td>This would be easy to do in Epic with the transition of rituximab after chemotherapy inpatient for rituximab outpatient orders</td>
<td>Outpatient order sets would take some time to develop and would require increased time to develop in the EMR</td>
<td>Clinical oncology pharmacists worked with the IT team, and nurse coordinators and infusion pharmacists alongside physicians in developing the orders to ensure compliance and speed of developing order sets in the EMR</td>
</tr>
</tbody>
</table>
Criteria for Patient Selection for Outpatient Chemotherapy

Outpatient Evaluation

Patient
Location
Transportation
Clinical management
Supportive care management
After-hours care
Question #2

Which of the following regimens does not have data for outpatient treatment?

A. ICE
B. EPOCH
C. HCVAD Mod B
D. Clofarabine
E. All of the Above
Rituximab

Majority of chemotherapy was given on inpatient days with inpatient chemotherapy.
All of these had pegfilgrastim administered in the outpatient setting day after discharge.
Data provided had shown equal efficacy in day of and day after treatment.
## Transitioned Rituximab Outpatient

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Disease State</th>
<th>Rituximab Administration Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHOP-R</td>
<td>NHL</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>MiniCHOP-R</td>
<td>NHL</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>CEOP-R</td>
<td>NHL</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>CHOEP</td>
<td>NHL</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>CVP-R</td>
<td>NHL</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>ICE-R</td>
<td>NHL</td>
<td>Day 4 Outpatient Rituximab</td>
</tr>
<tr>
<td>ESHAP-R</td>
<td>NHL</td>
<td>Day 5 Outpatient Rituximab</td>
</tr>
<tr>
<td>DHAP-R</td>
<td>NHL</td>
<td>Day 5 Outpatient Rituximab</td>
</tr>
<tr>
<td>CVAD-R</td>
<td>NHL</td>
<td>Day 5 Outpatient Rituximab</td>
</tr>
<tr>
<td>REPOCH/EPOCH(DA) -R</td>
<td>NHL</td>
<td>Day 5 Outpatient Rituximab</td>
</tr>
<tr>
<td>CODOX-M/IVAC-R</td>
<td>Lymphoma</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>MPV-R</td>
<td>Lymphoma</td>
<td>Day Outpatient Discharge</td>
</tr>
<tr>
<td>HCVAD-R</td>
<td>MCL</td>
<td>Day 5</td>
</tr>
<tr>
<td>CD20+ ALL Regimens*</td>
<td>ALL</td>
<td>After Discharge</td>
</tr>
</tbody>
</table>
Practice Model Implementation

Physicians had no issues with the change in practice
Decreased inpatient bed stays
Increased utilization with order set implementation
Automatic uptick except for a few patients
Increased adherence to our own site specialty pharmacy
Decreased inpatient costs for chemotherapy
Increased the role and focus of clinical ambulatory oncology pharmacists
Example of Outpatient Rituximab (ICE-R)

Patient authorization

- Inpatient and Outpatient Release

Rituximab often falls on the same day as pegfilgrastim

We had anecdotal decrease in reactions since implementation

- Evaluation still pending
Outpatient Chemotherapy Transition Checklist

- Selected chemotherapy available to be administered outpatient
- Financial approval
  - Infusion pumps covered
- Infusion center hours
  - Current schedule prohibits specific chemotherapy
- Nursing staff
  - Education with nurse coordinators
  - Education with infusion nurses on administration and side effect monitoring
- Pharmacy/specialty pharmacy
  - Education on regimens and supportive care treatments
Infusion Pumps

Key to developing outpatient chemotherapy orders

Addressing pumps for chemotherapy orders
- EPOCH
- VAD
- Cytarabine infusions
- Ifosfamide orders
- Mesna pumps

Evaluate work flow with “Smart Pumps”
- Air in the lines/Extravasation/Irritants/Closed system devices

State board of pharmacy laws

Address education with patients/caregiver for pump issues
Clinical Ambulatory Oncology Pharmacists
Role in Outpatient Chemotherapy

Ambulatory clinical specialists work to address chemotherapy orders appropriate for inpatient treatment/outpatient treatment.

Chemotherapy counseling instituted for all new chemotherapy patients.

Direct oral oncolytics and supportive care medications to our specialty pharmacy.

Evaluate and monitor chemotherapy orders for continued treatment and dose modifications.
<table>
<thead>
<tr>
<th>Regimen</th>
<th>Disease State</th>
<th>Chemotherapy Treatment</th>
<th>Chemotherapy Treatment</th>
</tr>
</thead>
</table>
| R-ICE        | NHL           | **Day 1**  
Rituximab 375 mg/m2  
Etoposide 100 mg/m2  
Ifosfamide 1667 mg/m2/Mesna 1667 mg/m2  
Mesna Pump 1000 mg/m2 over 18 hours  
**Day 2**  
Etoposide 100 mg/m2  
Carboplatin AUC 5  
Ifosfamide 1667 mg/m2/Mesna 1667 mg/m2  
Mesna Pump 1000 mg/m2 over 18 hours | **Day 3**  
Etoposide 100 mg/m2  
Ifosfamide 1667 mg/m2/Mesna 1667 mg/m2  
Mesna Pump 1000 mg/m2 over 18 hours  
**Day 4**  
Pump D/C  
Neulasta |
| R-ESHAP      | NHL           | **Day 1**  
Rituximab 375 mg/m2  
Etoposide 40 g/m2  
Cisplatin 25 mg/m2  
**Day 2**  
Methylprednisolone 250 mg  
Etoposide 40 g/m2  
Cisplatin 25 mg/m2 | **Day 3**  
Methylprednisolone 250 mg  
Etoposide 40 g/m2  
Cisplatin 25 mg/m2  
**Day 4**  
Methylprednisolone 250 mg  
Etoposide 40 g/m2  
Cisplatin 25 mg/m2  
Cytarabine 2000 mg/m2 |
| R-DHAP       | NHL           | **Day 1**  
Cisplatin 1000 mg/m2  
**Day 2**  
Cytarabine 2000 mg/m2 q 10 hours  
**Day 3**  
Rituximab 375 mg/m2  
Neulasta |                                                                                       |
| R-CVAD       | NHL           | **Day 1**  
Cyclophosphamide 750 mg/m2  
Vincristine/Doxorubicin 4 day pump | **Day 5**  
Pump D/C  
Neulasta |
| R-EPOCH/R-EPOCH(DA) | NHL | **Day 1**  
Pump Doxorubicin 10 mg/m2  
Etoposide 50 mg/m2 / Vincristine 0.4 mg/m2 | **Day 5**  
Pump D/C  
Rituximab 375 mg/m2  
Cyclophosphamide 750 mg/m2 |
Example of Outpatient EPOCH Order Set

Monitoring parameters

Hepatitis B labs for rituximab

One set of labs at initiation of chemotherapy

Take-home medications prior to initiation which is evaluated by the clinical ambulatory oncology pharmacist
## Leukemia Outpatient Chemotherapy

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Disease State</th>
<th>Chemotherapy Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5+2</strong></td>
<td>AML</td>
<td><strong>Day 1 -3</strong>&lt;br&gt;Daunorubicin 60 mg/m²&lt;br&gt;Cytarabine 100 mg/m² I.V. 24 hours&lt;br&gt;<strong>Day 4 -5</strong>&lt;br&gt;Cytarabine 100 mg/m² I.V. 24 hours&lt;br&gt;<strong>Day 6</strong>&lt;br&gt;Pump D/C</td>
</tr>
<tr>
<td><strong>FLA/FLAG</strong></td>
<td>AML</td>
<td><strong>Day 1 -5</strong>&lt;br&gt;Fludarabine 30 mg/m²&lt;br&gt;Cytarabine 2 g/m²&lt;br&gt;Growth Factor added on for Days 1-5 for FLAG</td>
</tr>
<tr>
<td><strong>ME/MEC</strong></td>
<td>AML</td>
<td><strong>Day 1 -5</strong>&lt;br&gt;Mitoxantrone 10 mg/m² I.V&lt;br&gt;Etoposide 100 mg/m² I.V</td>
</tr>
<tr>
<td><strong>HIDAC^</strong></td>
<td>AML</td>
<td><strong>Day 1,3,5</strong>&lt;br&gt;Cytarabine 3g/m² I.V every10hrs&lt;br&gt;^ Dose reduced for age</td>
</tr>
<tr>
<td><strong>Clofarabine or Clofarabine/HiDAC</strong></td>
<td>AML/ALL</td>
<td><strong>Day 1-5</strong>&lt;br&gt;Clofarabine 40 mg/m²</td>
</tr>
</tbody>
</table>
## Solid Tumor Regimens

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Disease State</th>
<th>Chemotherapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VIP</strong></td>
<td>Testicular Cancer</td>
<td><strong>Day 1 - 5</strong>&lt;br&gt;Ifosfamide 1200 mg/m²/&lt;br&gt;Cisplatin 25 mg/m²&lt;br&gt;Mesna Pump 720 mg/m²&lt;br&gt;<strong>Day 6</strong>&lt;br&gt;Pump D/C&lt;br&gt;Neulasta</td>
</tr>
</tbody>
</table>
Metrics to Evaluate

“If I can’t measure it, I can’t manage it.”

- Peter Drucker
Outpatient Chemotherapy Metrics

1. High-cost chemotherapy inpatient
   1. Rituximab
   2. Clofarabine
2. Transitioned chemotherapy outpatient/inpatient
3. Inpatient bed days stay
4. Medication assistance programs
5. Additional metrics
   1. Febrile neutropenia admissions
   2. Emergent room visits
   3. Time to inpatient start
   4. Length of time for each day of outpatient chemotherapy
   5. Outcomes
Metrics with EHR

Electronic health care record
  ◦ Epic

Built automatic reports for transitioned chemotherapy
  ◦ Outpatient Rituximab

Built reports for outpatient chemotherapy orders

Reports on chemotherapy duration for inpatient chemotherapy
## Rituximab Transitioned Chemotherapy

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>23</td>
<td>4</td>
<td>7</td>
<td>53</td>
<td>15</td>
</tr>
</tbody>
</table>

### Diagnosis

| NHL/ALL/BH                    | 21/1/1                                       | 4/0/0                                         | 6/0/0                                   | 49/8/0                                        | 15/0/0                                        |

### Lymphoma

| CHOP/ First Dose CHOP         | 10/9                                         | 0                                             | 2/2                                     | 6/6                                           | N/A                                           |
| CVP/ First Dose CVP           | 0                                            | 0                                             | 1/1                                     | 1/1                                           | N/A                                           |
| CEOP/ First Dose CEOP        | 0                                            | 0                                             | 1/1                                     | 1/1                                           | N/A                                           |
| Mini-CHOP/ First Dose Mini-CHOP | 0                                           | 0                                             | 1/1                                     | 1/1                                           | N/A                                           |
| EPOCH                         | 3                                            | 2                                             | 1                                       | 39                                            | 37                                            |
| ICE                           | 13                                           | 2                                             | 1                                       | 26                                            | 4                                             |
| ESHAP                         | 0                                            | 0                                             | 0                                       | 0                                             | 0                                             |
| DHAP                          | 3                                            | 0                                             | 0                                       | 9                                             | 3                                             |
| GIFOX                         | 0                                            | 0                                             | 0                                       | 2                                             | 0                                             |
| CVAD                          | 0                                            | 0                                             | 0                                       | 2                                             | 2                                             |
| Codox/IVAC                    | 1                                            | 0                                             | 0                                       | 9                                             | N/A                                           |
| Rituximab                     | 0                                            | 0                                             | 3                                       | 0                                             | N/A                                           |
| bortezomib/Ibrutinib          | 1                                            | 0                                             | 0                                       | 0                                             | N/A                                           |
| HD-MTX/HD Ara-C/Thiotepa      | 0                                            | 0                                             | 0                                       | 2                                             | N/A                                           |
| MPV                           | 0                                            | 0                                             | 0                                       | 12                                            | N/A                                           |
| HD MTX/ARA-C                  | 0                                            | 0                                             | 0                                       | 4                                             | N/A                                           |
| MTX/VCR                       | 1                                            | 0                                             | 0                                       | N/A                                           |                                               |
| HCVAD                         | 1                                            | 0                                             | 0                                       | 15                                            | N/A                                           |
| ALL                           |                                              |                                               |                                         |                                               |                                               |
| Larson/HCVAD                  | 0/1                                          | 0/0                                           | 0/0                                     | 1/7                                           | N/A                                           |
Transitioned Rituximab to Outpatient Summary

Benchmark goal for implementation was 90% outpatient administration

Transitioned 35 Inpatient versus 137 rituximab patients treated outpatient

Inpatient rituximab savings >$925,000

Average inpatient day stay decreased by ~9 hours
  ◦ Rituximab was often administered the next day in the morning

Unrealized reimbursement potential outpatient treatment

Automatic billing for waste with rituximab
Developing Proposed Restrictions for Rituximab

Rituximab Restrictions for Inpatient Oncology Use

- Immune Thrombocytopenic Purpura (ITP)\(^\textsuperscript{a}\) - dose reduced rituximab 100 mg
- Cold Agglutinin Disease
- Post-Transplant Lymphoproliferative Disease (PTLD)
- Auto-Immune Hemolytic Anemia (AIHA)
- Prolonged chemotherapy inpatient stays requiring continued treatment

\(^\textsuperscript{a}\)Zaja F et al. Eur J Haematol. 2010;85:329-34
### Transitioned Outpatient Chemotherapy

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Treatments</th>
<th>Patients</th>
<th>Inpatient Average Bed Stay hours (UACC)</th>
<th>Inpatient Bed Days Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphoma</td>
<td>56</td>
<td>19</td>
<td>47.3</td>
<td>5.9125</td>
</tr>
<tr>
<td>R+/DHAP</td>
<td>3</td>
<td>1</td>
<td>133.5</td>
<td>205.8125</td>
</tr>
<tr>
<td>R+/EPOCH</td>
<td>37</td>
<td>9</td>
<td>133</td>
<td>22.16666667</td>
</tr>
<tr>
<td>R+/ICE</td>
<td>4</td>
<td>2</td>
<td>120</td>
<td>10</td>
</tr>
<tr>
<td>R+/IGEV</td>
<td>2</td>
<td>1</td>
<td>122</td>
<td>30.5</td>
</tr>
<tr>
<td>R+/ESHAP</td>
<td>6</td>
<td>3</td>
<td>127.18</td>
<td>10.598333333</td>
</tr>
<tr>
<td>R+/CVAD</td>
<td>2</td>
<td>2</td>
<td>96</td>
<td>8</td>
</tr>
<tr>
<td>VitD</td>
<td>2</td>
<td>1</td>
<td>89</td>
<td>8</td>
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<tr>
<td>Rituximab OP Cost Savings</td>
<td></td>
<td></td>
<td></td>
<td>$401,431</td>
</tr>
<tr>
<td>AML Regimens</td>
<td>35</td>
<td>15</td>
<td>156</td>
<td>6.5</td>
</tr>
<tr>
<td>ME</td>
<td>1</td>
<td>1</td>
<td>192</td>
<td>40</td>
</tr>
<tr>
<td>FLA</td>
<td>5</td>
<td>4</td>
<td>190</td>
<td>118.75</td>
</tr>
<tr>
<td>HI-DAC</td>
<td>15</td>
<td>6</td>
<td>161.4</td>
<td>47.075</td>
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<td>Clofarabine</td>
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<td>160</td>
<td>13.333333333</td>
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<tr>
<td>Clofarabine/HI-DAC</td>
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<td>2</td>
<td>139.5</td>
<td>5.8125</td>
</tr>
<tr>
<td>Clofarabine Cost Savings</td>
<td></td>
<td></td>
<td></td>
<td>$575,269.7</td>
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<td>Solid Tumor Regimens</td>
<td>10</td>
<td>5</td>
<td>744</td>
<td>155</td>
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<td>VeIP</td>
<td>5</td>
<td>2</td>
<td>104.5</td>
<td>17.41666667</td>
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<tr>
<td>TIP</td>
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<td>2</td>
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<td>5.8125</td>
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<tr>
<td>Total Outpatient Regimens Administered</td>
<td>91</td>
<td>39</td>
<td></td>
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<tr>
<td>Total Inpatient Days Saved</td>
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<td></td>
<td></td>
<td>696.8775</td>
</tr>
</tbody>
</table>
Comparison of Inpatient to Outpatient Chemotherapy Regimens

Number of Cycle of Chemotherapy

Chemotherapy Regimens

- EPOCH
- ESHAP
- ICE
- FLA/FLAG
- HiDAC
- Clofarabine
- VeIP

Inpatient
Outpatient
Transitioned Outpatient Chemotherapy

Benchmarked at 50% for chemotherapy outpatient implementation

Transitioned 56 chemotherapy regimens to the outpatient setting

Transitioned >$ 400,000 rituximab to outpatient

Transitioned > $575,000 clofarabine to outpatient

Inpatient bed days saved total over 696

Underutilized ICE regimens for OP use

Reimbursement changes to outpatient still being evaluated
Medication Assistance Program

Current workflow for medication assistance programs was changed

Since 2016, developed financial counselors to evaluate up-front patient assistance evaluations on all patients

Each of our patients have a tallied amount for our accounts for patient assistance provided

Over 30 patients received assisted housing for local treatments

Rituximab cost savings for our chemotherapy yield over
  ◦ 10 patients totaling $26,000 worth of copay support

Clofarabine
  ◦ No patients required copay assistance
Future Outpatient Chemotherapy

Chemotherapy
HCVAD Mod A
DCEP
VTD-PACE
GIFOX

Transitioning Outpatient Transplant Conditioning Regimens
Thiotepa/Carmustine*
Melphalan
BEAM
BEC
Takeaway Points

1. Always involve your financial team!!!
2. Nurse education is critical if not key
3. Team approach works best to develop this practice model for chemotherapy
4. Clinical ambulatory oncology pharmacists are key in this process for selection of patients and patient adherence with supportive care medications
5. Spend time with your infusion staff on pumps to address potential issues
Summary

1. Evaluate implementation for outpatient chemotherapy
   - Overall costs may become pivotal in the era of a future of DRG based payments (OCM^)
2. Bring key players to the table to address concerns and mitigate issues before they happen
3. Develop a stepwise plan for implementation
4. Make sure you pick the right patient for outpatient chemotherapy

^Oncology Care Model
Questions