Spectra Optia®
Mononuclear Cell (MNC) Collection

Theo Bannink
WHY A NEW PLATFORM?

The Cobe Spectra is used in more than 100,000 MNC collections each year.

Cobe Spectra is available with two programs MNC and AutoPBSC

Spectra Optia has been designed to replace the current Cobe Spectra apheresis system with the latest technology.

The Spectra Optia MNC protocol combines the relative higher Collection Efficiency (%CE) found on Cobe Spectra’s MNC procedure with the relatively higher purity levels associated with the AutoPBSC procedure. And at the same time adding consistency through automation.
April 2007: CE-marked for Therapeutic Plasma Exchange (Optia TPE)

August 2007: FDA approval for TPE in the US

Today: TPE is sold in more than 40 countries all over the world.

Optia TPE is fast, easy and safe.

January 2008: CE–marked for White Blood Cell Collection (Optia MNC), and September start MNC clinical trial in Europe
Basic Principles of the MNC Procedure

ECV = 191 ml
Primary separation:
- Cells are separated based on specific gravity.
- AIM system controls the swirl in the collect port by adjusting the plasma pump flow rate.
Process Control Screen

- Collect port
- Interface
- Swirl at Collect Port
- Baseline Established
- Graph
Secondary separation:

- Cells are separated by size.
- Platelets are continuously pumped to the reservoir.
- Chamber is filled with cells.
- When the chamber is full, the chamber contents are collected.
Collection Phase: First Stage

1. Collect valve opens.
2. Plasma pump stops.
3. Packing factor decreases to 7.
4. Collect pump flow rate increases.
5. Plasma is used to flush the chamber contents to the collection bag.
Collection Phase: Second Stage

1. Collect pump stops.
2. Packing factor increases to 20.
3. Plasma pump restarts to re-establish the interface.
4. Collect pump restarts to flush cells in the collect line past the collect valve.
5. Collect valve closes.
Optia MNC study
Procedure data summary
What are the communicated core needs?

Top Customer needs

- Versatility – MNC is the second (of many) protocols
- Flexibility – Operator control, variety of patients
- Automate to eliminate errors- identifies and corrects process variations
- Ease of Use
- Cell Viability/Functionality – Do the cells engraft?
- Performance – Cells in the Bag, Efficiency, Purity
Validation Metrics

Collection efficiency and yield

Purity

Viability of the CD34+ cells and engraftment

System Performance in Patient Environment

Final product volume.

Operator Usability / Trainability
EUT 4 Data

• N=15 runs
• Patients from three sites from 09.09.08 – 02.10.08
• Diagnosis included
  • Multiple Myeloma
  • Non-Hodgkin’s Lymphoma
  • Burkitt’s Lymphoma
  • Hodgkin’s Disease
<table>
<thead>
<tr>
<th>Patient data - Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body weight</strong> 74kg (45 – 105)</td>
</tr>
<tr>
<td><strong>TBV</strong> 4500mL (3024 – 5854)</td>
</tr>
<tr>
<td><strong>Blood processed</strong> 11406mL (5466 – 15752)</td>
</tr>
<tr>
<td><strong>Pre WBC.</strong> 9.7 x10⁶/mL (3.3 – 55.8)</td>
</tr>
<tr>
<td><strong>Pre PLT</strong> 93 x10⁶/mL (21 – 234)</td>
</tr>
<tr>
<td><strong>Pre CD34+</strong> 73/uL (15 – 314)</td>
</tr>
<tr>
<td><strong>TBV Processed</strong> 2.30 (1.39 – 4.18)</td>
</tr>
</tbody>
</table>
Interim results of Spectra Optia® Mononuclear Cell (MNC) Collection study on chemotherapy

Table 1. Data summary

<table>
<thead>
<tr>
<th>Patient Data Pre-Count</th>
<th>N=15</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBV (ml)</td>
<td>4500</td>
<td>3024</td>
<td>5854</td>
<td></td>
</tr>
<tr>
<td>WBC x 10^3/μL</td>
<td>9.7</td>
<td>3.3</td>
<td>55.8</td>
<td></td>
</tr>
<tr>
<td>CD34+ /μL</td>
<td>73</td>
<td>14.9</td>
<td>314.2</td>
<td></td>
</tr>
<tr>
<td>Platelets x 10^3/μL</td>
<td>93</td>
<td>21.0</td>
<td>234.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>CD34+ Collection Efficiency</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>54.7%</td>
<td>31.9%</td>
<td>70.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hct%</td>
<td>2.2%</td>
<td>0.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td></td>
<td>Granulocytes %</td>
<td>17.2%</td>
<td>0.0%</td>
<td>51.2%</td>
</tr>
<tr>
<td></td>
<td>Platelets x 10^3/μL</td>
<td>613</td>
<td>50</td>
<td>1240</td>
</tr>
<tr>
<td></td>
<td>Volume (ml)</td>
<td>200</td>
<td>129</td>
<td>320</td>
</tr>
</tbody>
</table>
CD34+ Collection Efficiency

Chart 1. Performance

CD34+ Collection Efficiency

0%
20%
40%
60%
80%
100%

54.7%

CE (median)
Product CD34+ Dose/kg

Chart 2. Final product

Product CD34+ Dose/kg

2.00E+10^7

1.00E+10^7

6.10E+06

0.00E+10^6

Product CD34+ dose x10^6/kg
Chart 3. Processing: Total time

Procedure Time

Minutes

Procedure time (minutes)
(median)

0
50
100
150
200
250
300
350
400

250
Chart 4. Final Product: Volume

Final Product Volume

<table>
<thead>
<tr>
<th>Volume (mL)</th>
<th>400</th>
<th>350</th>
<th>300</th>
<th>250</th>
<th>200</th>
<th>150</th>
<th>100</th>
<th>50</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final product volume (mL) (median)</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chart 5. Performance: Platelet collection efficiency

Platelet Collection Efficiency

Collection efficiency PLT (median)
Chart 6. Performance: RBC residuals

RBC Residuals

RBC residual volume (mL)

<table>
<thead>
<tr>
<th>0%</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

RBC mL (median) 5.7
Mobilized Donor Data summary

- Preliminary performance from initial feasibility study performed on mobilized donors
- Data updated since presentation at EBMT (March 2008) and ASFA (April 2008)
- Donors mobilized using 10mcg/kg GCSF x 3 days

Table 1. Mobilized donor data summary

<table>
<thead>
<tr>
<th>Pre-Count</th>
<th>N=21</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBV (ml)</td>
<td>5629</td>
<td>4292</td>
<td>7876</td>
<td></td>
</tr>
<tr>
<td>WBC x 10^3/µL</td>
<td>41</td>
<td>23</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>CD34+ /µL</td>
<td>43</td>
<td>9</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>Platelets x 10^9/µL</td>
<td>237</td>
<td>126</td>
<td>334</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LY+MO Eff.</td>
<td>65.9%</td>
<td>34.2%</td>
<td>148.4%</td>
<td></td>
</tr>
<tr>
<td>CD34+ Eff.</td>
<td>60.5%</td>
<td>33.5%</td>
<td>101.9%</td>
<td></td>
</tr>
<tr>
<td>Platelets x 10^9/µL</td>
<td>970</td>
<td>548</td>
<td>1945</td>
<td></td>
</tr>
<tr>
<td>Hct%</td>
<td>0.6%</td>
<td>0.0%</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>Granulocyte %</td>
<td>4.0%</td>
<td>1.0%</td>
<td>28.7%</td>
<td></td>
</tr>
<tr>
<td>Volume (ml)</td>
<td>239</td>
<td>125</td>
<td>373</td>
<td></td>
</tr>
</tbody>
</table>
“The MNC protocol brings the value of efficiency, purity, and consistency to cell collections - ultimately benefiting patients, clinicians and laboratory processes.”
Thank you.

We welcome you in our booth for more information.