Preconference Issue
Topics in
Multiple Trauma LCP
JOURNAL OF NURSE LIFE CARE PLANNING

Fall 2010 Preconference Issue

Contributing Editor
Linda Husted

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Journal of Nurse Life Care Planning

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Journal of Nurse Life Care Planning is published quarterly in Spring, Summer, Winter, and Fall. Members of AANLCP receive the Journal subscription electronically as a membership benefit. Back issues will be made available in electronic (PDF) format on the association website. JNLCP has also been accepted for index in the Cumulative Index of Nursing and Allied Health Literature, www.ebscohost.com/cinahl/

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Editor’s Note

First, many thanks to Linda Husted, the contributing editor for this issue, who took time out from her own very busy life to help bring you this excellent content. The prospectus on multiple trauma management research is intriguing; we will report on results when they are available. The article on PTSD gives the Life Care Planner some ideas for assessment and resources. Thank her when you see her!

As we head into our annual meeting, it’s an interesting time for our profession; we all know about the apocryphal “Chinese curse” to that effect. We believe nurses have a unique conceptual framework to bring to the profession of Life Care Planning. We believe the nursing process is most effective way to assess and address our patients’ challenges holistically; our own challenge is to educate potential clients, other disciplines, and the public on just why and how that is. I am sure that many of our members join me in hoping that our certification board members will complete the tasks required for successful certification by the American Board of Nursing Specialties that has eluded us for so long. This will increase our credibility in a way that can effectively address legitimate consumer concerns about our value.

However, hope is not a plan. This issue brings us contributions from many points of the caring compass. There is only one CNLCP submission among them, a conference speaker essay. Our annual conference likewise offers us speakers from many disciplines; six of the 23 speakers with clinical backgrounds are CNLCPs. More life care planners practice in areas which do not involve litigation at all, notably but not solely in elder care; our conference agenda, once heavily litigation-focussed, is more collaborative.

I believe that in these interesting times we need to focus outward, not inward. It may be that the best way for nurses to impact the profession of Life Care Planning is by collaboration, not competition, with the many colleagues around us in related disciplines. I believe this can be done without compromising our distinctive intrinsic value as Nurse Life Care Planners if, for example, we act in combination with our nurse colleagues in legal nursing and lifetime care planning. A federation or partnership, if not a merger, would strengthen and enrich us all. What are your thoughts?

We’ll see you in Boston. We have a lot to talk about.

Cordially,

Wendie Howland
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The American Association of Nurse Life Care Planners (AANLCP) promotes the unique qualities the Registered Nurse delivers to the Life Care Planning process.
We support education, research, and standards related to the practice of Nurse Life Care Planning.

IN RECOGNITION
Kathy Pouch RN BSN CCM CNLCP LNCC

We, the Editorial Board, would like to recognize and thank Kathy Pouch for her long and distinguished service to the organization and to the Journal and Newsletter in particular. Many folks may not know that in years past as your Editorial Chair she used to get the print version out from her home, soliciting articles, typing them, getting them to a local printer, pasting mailing labels on them by hand, and hauling boxes of them to the post office. She recruited most of us, whipped us into shape, and coached and supported us unstintingly through challenging times. The Journal would not have survived without her. And all this while completing her BSN!

Now as she hands over the reins to Shelly Kinney and goes on to her master’s program, we wish her continued great success in whatever she does, more time to spend with that cute grandchild, and our deepest appreciation and gratitude.
Information for Authors

AANLCP invites interested nurses and allied professionals to submit article queries or manuscripts that educate and inform the Nurse Life Care Planner about current clinical practice methods, professional development, research, and the promotion of Nurse Life Care Planning within the medical-legal community. Submitted material must be original. Manuscripts and queries may be addressed to the Editorial Committee. **Authors should use the following guidelines for articles to be considered for publication. Please note capitalization of Nurse Life Care Plan, Planning, etc.**

Text

Manuscript length: 1500 – 3000 words

- Use Word© format only (.doc)
- Submit only original manuscript not under consideration by other publications
- Put the title and page number in a header on each page (using the Header feature in Word)
- Set 1-inch margins
- Use Times, Times New Roman, or Ariel font, 12 point
- Use double-spacing, using the Word formatting feature
- Place author name, contact information, and article title on a separate title page, so author name can be blinded for editorial review
- Use APA style (Publication Manual of the American Psychological Association)

Art and Figures

All photos, figures, and artwork should be in TIFF, EPS, or JPG format. Line art should have a minimum resolution of 1000 dpi, halftone art (photos) a minimum of 300 dpi, and combination art (line/tone) a minimum of 500 dpi.

Each table, figure, photo, or art should be on a separate page, labeled to match its reference in text, with credits if needed (e.g., Table 1, *Common nursing diagnoses in SCI*; Figure 3, *Time to endpoints by intervention, American Cancer Society, 2003*).

Editing and Permissions

The author must accompany the submission with written release from:

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- any recognizable person in a photograph, for unrestricted use of the image
- any copyright holder, for copyrighted materials including illustrations, photographs, tables, etc.

- All authors must disclose any relationship with facilities, institutions, organizations, or companies mentioned in their work.
- All accepted manuscripts are subject to editing, which may involve only minor changes of grammar, punctuation, paragraphing, etc. However, some editing may involve condensing or restructuring the narrative. Authors will be notified of extensive editing. Authors will approve the final revision for submission.
- The author, not the Journal, is responsible for the views and conclusions of a published manuscript.
- Submit your article as an email attachment, with document title *articlename.doc*, e.g., *wheelchairs.doc*

All manuscripts published become the property of the Journal. Manuscripts not published will be returned to the author. Queries may be addressed to the care of the Editor at whowland@howlandhealthconsulting.com

Manuscript Review Process

Submitted articles are peer reviewed by Nurse Life Care Planners with diverse backgrounds in life care planning, case management, rehabilitation, and the nursing profession. Acceptance is based on manuscript content, originality, suitability for the intended audience, relevance to Nurse Life Care Planning, and quality of the submitted material. If you would like to review or a book articles for this journal, please contact the Editor.

AANLCP Journal Committee for this issue

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Erratum:

The previous issue (X.2) credits Dr. Roger Weed with developing the Problem Oriented Medical Record and SOAP/IER notes. In discussing this with Dr. Weed I learned that these were, in fact developed by his distant cousin, Lawrence Weed. I regret the error and appreciate Dr. Roger Weed’s good-natured correction.

_Editor_
Contributing To this Issue

Penelope Caragonne PhD (“Automated Assessment Protocol: Case Management Support Needs”) has served persons with multiple disabilities for over 36 years. She has lectured extensively on long-term planning and case management as a model for comprehensive service delivery both within and outside a litigation context. She also provides long-term case management services to individuals with catastrophic injuries, assistive technology assessment, prescription, installation, training and repair services. Her company offers job site modification, educational access services, and forensic assessment, consultation, and testimony. She has served as Vice President of External Affairs, American Rehabilitation Economics Association, book review editor of The Earnings Analyst, Director of Research, International Association of Rehabilitation Professionals in the private sector and has authored multiple articles for the rehabilitation and forensic economics literature.

Gregory Leskin, PhD (“PTSD and Traumatic Brain Injury: Implications for Life Care Planning”) is the Director for Military Families Initiatives for the UCLA based National Center for Child Traumatic Stress Network. Prior to joining UCLA, Dr. Leskin worked as a clinical researcher at the National Center for PTSD, VA Palo Alto Health Care System. Dr. Leskin has consulted and lectured extensively with the Department of Veterans Affairs, US Marine Corps, Navy, and Army staff on a number of topics, including assessment and treatment for PTSD, rehabilitation strategies for blast-related traumatic brain injury, and promoting psychological resilience. He completed an NIMH post-doctoral fellowship at the National Center for PTSD, Behavioral Sciences Division at the Boston VA Medical Center in 1998.

Penelope Caragonne PhD (“Automated Assessment Protocol: Case Management Support Needs”) has served persons with multiple disabilities for over 36 years. She has lectured extensively on long-term planning and case management as a model for comprehensive service delivery both within and outside a litigation context. She also provides long-term case management services to individuals with catastrophic injuries, assistive technology assessment, prescription, installation, training and repair services. Her company offers job site modification, educational access services, and forensic assessment, consultation, and testimony. She has served as Vice President of External Affairs, American Rehabilitation Economics Association, book review editor of The Earnings Analyst, Director of Research, International Association of Rehabilitation Professionals in the private sector and has authored multiple articles for the rehabilitation and forensic economics literature.

Joseph Bleiberg, PhD, ABPP-CN, CLCP is President of Bethesda Neuropsychology, LLC and is a Senior Policy Analyst, Medical Care Systems, Altarum Institute. From 1985 to 2008 he was at National Rehabilitation Hospital in multiple roles, including Program Director of the Brain Injury Program, President of Integrated Brain Injury Systems, Director of the Center for Cognitive Neuroscience, and Director of Psychology. Dr. Bleiberg has been a clinical associate professor (neurology) at the Georgetown University School of Medicine since 1987. From 1979 to 1985, Dr. Bleiberg was the Director of Psychology at the Rehabilitation Institute of Chicago. Dr. Bleiberg received his doctorate in psychology from Boston University in 1977, is board-certified in clinical neuropsychology, and is a certified life care planner.

Patricia Brock, RN, MSN, LNCC, CLCP, HTI Legal Nurse Consulting and Life Care Planning in Orange City, Florida (“From Clinical Nurse to Entrepreneur: Becoming a Life Care Planner”)

Shelene Giles, RN, BSN, BA, MS, CRC, CNLCP, MSCC Past-President AANLCP 2008, “I always found comfort in helping others.”

Judy Seidmeyer, R.Ph., is President for Care Giver Support Products, LLC. ("I really did not plan to become a caregiver").

Mona Yudkoff, BSN MPH CRRN CCM CLCP, Mona Yudkoff Rehab Consultants, “Making the Leap”
Cancellation Policy

All cancellations must be in writing and sent to AANLCP. You will receive a full refund, minus $100 processing fee to all cancellations postmarked on or before September 15, 2010. Cancellations postmarked or received September 15 to September 29, 2010 will receive a 50% refund minus the $100 processing fee. No refunds after September 29, 2010. Please keep a copy of your registration form for your records. AANLCP reserves the right to substitute faculty or to cancel due to low enrollment of other unforeseen circumstances. If AANLCP must cancel registrants will receive full credit or refunds of their paid registration fees. No refunds will be made for lodging or travel.

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<td>CNLCP Exam</td>
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<td>(Pre-course work req’d for ICHCC)</td>
<td>Member $425.00/Non-Mbr $625.00</td>
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<td>Empowerment-Using the Nursing Process in Life Care Planning</td>
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Automated Assessment Protocol, Case Management Support Needs: A Form for Use by Life Care Planners

Penelope Caragonne PhD

Federal and some state courts apply an evidentiary reliability standard to assess experts’ methodological validity. Many have replaced a limited general acceptance standard with an all-encompassing requirement for scientific validity (Reference Manual on Scientific Evidence, Second Edition, 2000). Rather than focusing on an expert’s qualifications to determine evidence admissibility, the courts now look at the methods that underlie the evidence. If an expert’s conclusions are speculative or based on untested assumptions, subjective belief, or assertions, that testimony is less likely to be admitted. Since testimony on an individual’s disability-related damages is used more and more in personal injury litigation, the courts place greater emphasis on its admissibility. Now that Life Care Planning is used to determine economic damages, damages experts must be able to demonstrate knowledge and understanding of:

• The purpose of long-term planning as an intervention, separate from litigation
• Client-based and service systems outcomes of long-term planning models used for the last forty years
• Investigating and collecting information during Life Care Plan development

To meet the additional standards discussed below, our practice relies, in part, on a variety of easy-to-use, structured protocols to develop long-term comprehensive plans. We use organized data collection instruments to obtain five outcomes:

• The long-term planning process is orderly, logical, coherent and consistent, and therefore reproducible
• Factual material presented can be cross-referenced and traced back to the original data source.
• The scientific methodology is clear enough to be understood by lay persons
• Thought processes which support and

Penelope Caragonne PhD has lectured extensively on long-term planning and case management as a model for comprehensive service delivery both within and outside a litigation context. She also provides long-term case management services to individuals with catastrophic injuries, assistive technology assessment, prescription, installation, training and repair services. Caragonne and Associates offers job site modification, educational access services, and forensic assessment, consultation, and testimony. She may be contacted at Mail@Caragonne.com or 866-285-0665 toll-free.
form the basis for each service recommendation are transparent and apparent to any reader of the Care Plan.

• The fundamental assumptions are such that opinions formed and conclusions drawn are acceptable in a court of law.

This article will focus on one of the forms we use to organize the data collection and planning process. We developed it to determine the range of annual and monthly case management intervention hours a given person with disabilities will require: low, moderate, or high. We will describe its design and implementation, its prior use in a public sector agency, and how it can be used to advantage in Life Care Planning and litigation.

Background
For many years, we provided case management consulting services to diverse public agencies for long-term disability cases, such as elders, those with mental illness and developmental delay, and persons suspected of child abuse and neglect. Regardless of the type of target group served, all these agencies used case management to provide services to their clients.

All case managers worked onsite in homes and local communities. Their agencies placed a strong emphasis on provider collaboration, comprehensive long-term planning, periodic re-evaluation, advocacy, and follow-up to ensure that clients received and used services as planned.

Funding was by federal, state, and local governments. The agencies shared two key features: fixed or significantly reduced case loads that ensure adequate services and prevent high levels of burn-out and turnover, and capitation reimbursement (fixed amount for each client enrolled).

It therefore became critical to make individual caseload assignments based on service needs and to justify budget based on service delivered to the entire client population.

Logic dictated that a caseload of high-intensity case management clients would occupy more case manager’s time than a caseload of only low-intensity clients. The supervisor and case managers agreed that the following were essential:

• defining what services low-, moderate-, and high-level needs included
• determining how many case management hours could be expected to need for each level
• classifying clients into levels with a valid tool
• using objective measures to make staff assignments fair and manageable

Knowing this information at the time of case referral could help a supervisor both to make assignments and to know how many hours a given client would add per staffer per year. This would help with long-term budgeting for staffing levels.

Rationale for the Design of the Assessment Protocol: Case Management Support Needs
The Assessment Protocol: Case Management Support Needs had to realistically reflect how and why a case manager organized time with an individual client. It had to be short and easy to use. It had to be understandable by novice or expert workers or supervisors.

We reviewed forms used in public agencies to assign low, moderate or high case management levels. Typically, they focused almost entirely on the characteristics of the client without reference to how these characteristics translated into, or affected, case management service hours. They asked only, “What client features about the client and client needs dictated minimal, moderate, or high levels of service hours by the case manager?”

We felt we needed to develop a form by which client

continued next page
needs could be understood in terms of the case manager’s future time responsibilities, at least for the first six months of service delivery. Case management hours could be reduced after a case stabilized. Case management levels could also be changed if the client circumstances destabilized or the client changed geographic locations.

Factors Influencing Assignment of Case Management Level
Staff identified five factors which influenced the amount of time a case manager spent with a client. They were:
- client’s support/independence status
- resources needed
- program planning
- coordination
- travel time

Applying the Form Set to Set Caseload Levels
We subtracted hours spent annually in supervision, vacation time, sick leave, and upgrade training from 2,080 hours (one full-time equivalent, FTE). The remaining hours were considered available for service delivery to clients.

Using the Assessment Protocol: Case Management Support Needs
As shown above, evaluating a client with disabilities for of the five factors provides justification for case manager hours per year required for service delivery. The factors can be explained to a third party without complicated language. Further, the results support the rationale for individual case management assignment. Maximum versus minimum hours in each category can be revised to reflect the unique workloads of different settings, e.g., in which the case manager’s average caseload is higher, or in telephonic case management.

Application to Life Care Planning
Increasingly, life care planners are required to explain or defend their recommendations for future services. Typical questions focus not only on why a service was recommended but also on how service hours shown were determined, how and what determined the frequency set for services, and why this number of hours specifically.

Benefits to Standardizing and Automating Data Collection Forms
Attorneys often focus on two primary areas of service recommendations during deposition or trial: hours allocated for case management support and hours allocated...
annually for attendant support. Expert planners are frequently asked to justify their recommendations. Beyond citing background, training and experience, Life Care Planners often find themselves without objective means to explain and describe their thought processes.

After reviewing many Life Care Plans, it is our opinion that hours allocated for these two areas generally fall far below the hours that will be actually needed. Using a standardized data collection instrument such as Assessment Protocol: Case Management Support Needs can guide the planning process and support a life care planner in four ways. First, the same objective questions are asked every time, which makes Plan development consistent from case to case. Second, the planning process can be easily replicated by another person. Third, the Planner’s decision processes are intuitively obvious and clear. Fourth, clarity makes the basis for a recommendation for case management straightforward and less susceptible to cross-examination.

Providing expert testimony need not be harrowing or discomfiting. With forms such as those described in this article, we hope to provide Planners with additional resources to place in their “Life Care Planning Toolkits.”

References

More Forms Already Automated at Caragonne and Associates, LLC

These forms have been designed to make the long-term planning process more defensible, reliable and transparent. They may be obtained free of charge from Caragonne and Associates by emailing mail@Caragonne.com, and used freely if credit is given to the authors. The JNLCP is grateful for this generous gift to our readers and invites conference attendees to meet the author at the conference in Boston.

Assessment Protocol: Case Management Support Needs has already been automated for use by life care planners who wish to install and use the form on their personal computers. A copy follows this article on pages 241-243

Intake and Assessment Form
Determination of Need Protocol, provides an objective and reproducible way to define the number of attendant hours per year needed by a person with disabilities

Adaptive Transportation Form helps a Planner precisely identify the range of adaptations important in determining transportation modifications

Agency-Based vs. Family Self-Hire provides a comparative--and defensible--framework for cost analysis for agency-based vs. family self-hire methods, and is used to explain this in deposition

Quality Assurance Form Set automates Life Care Plan evaluation looking at a set of objective indicators which denote superior vs. less-than-favorable planning processes
Automated Assessment Protocol, Case Management Support Needs
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This form will provide you with a method of determining and assigning a level of case management for the consumer and his/her family. The client's needs are linked to a score which represents the level of case management involvement necessary to assure that needs are met. The resulting level, therefore, reflects the time and effort needed by the case manager to adequately link the consumer to services, advocate for the consumer, coordinate the consumer's services, and follow-up to ensure that services are operating in accord with consumer needs. Review the client and or family members circumstances using the following dimensions and assign a score when indicated. Add the scores when you finish and determine:

| Low Level of Case Management: 00 - 04 | 1 - 4 HOURS PER MONTH |
| Moderate Level of Case Management: 05 - 11 | 5 - 7 HOURS PER MONTH |
| High Level of Case Management: 12 - 15 | 8 -12 HOURS PER MONTH |

<table>
<thead>
<tr>
<th>SCORE</th>
<th>DIMENSION</th>
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<tr>
<td></td>
<td>SUPPORT/INDEPENDENCE STATUS (ENTER 0, 2 or 3)</td>
</tr>
<tr>
<td></td>
<td>Very Independent/Little Need for Case Management Support (0)</td>
</tr>
<tr>
<td></td>
<td>The case manager does not need to take a leading role in supporting the client. The client needs only periodic encouragement or reinforcement to sustain his independence. (0)</td>
</tr>
<tr>
<td></td>
<td>Partially Dependent on the Case Manager (2)</td>
</tr>
<tr>
<td></td>
<td>The client needs regular support and encouragement from the case manager to conduct daily activities and life tasks independently. (2)</td>
</tr>
<tr>
<td></td>
<td>Totally Dependent on the Case Manager (3)</td>
</tr>
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|       | The client is quite vulnerable in many life areas, may show rapidly changing and variable functional levels, and is at risk of returning to or being maintained in a restrictive setting. The case manager provides frequent and regular support to the client, intervening actively with the client to assist and/or orient him/her.

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<table>
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<th>RESOURCE NEED STATUS (ENTER 0, 2, or 3)</th>
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<tr>
<td><strong>No additional resources needed (0)</strong></td>
</tr>
<tr>
<td>The client has obtained and is retaining needed resources.</td>
</tr>
<tr>
<td><strong>Few additional resources needed/little referral activity (2)</strong></td>
</tr>
<tr>
<td>Client has natural and resource support which can share responsibility with the case manager for accessing needed resources and services.</td>
</tr>
<tr>
<td><strong>Multiple resources needed/extensive referral activity (3)</strong></td>
</tr>
<tr>
<td>The client has service needs requiring involvement with several different agencies and providers of services. The major responsibility for initiating referrals, and locating, arranging, and obtaining resources lies with the case manager.</td>
</tr>
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<th>PROGRAM PLANNING STATUS (ENTER 0, 2, or 3)</th>
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<tr>
<td><strong>Annual reappraisal only required (0)</strong></td>
</tr>
<tr>
<td>The client's status is relatively stable and likely to remain so, with planned services in place and major life needs met.</td>
</tr>
<tr>
<td><strong>Semi-annual review required (2)</strong></td>
</tr>
<tr>
<td>The client's status is subject to change during the year because of possible negative factors such as unstable or vulnerable support system or because of possible positive factors such as fairly rapid progress or skill acquisition. The plan may require more frequent review in order for the case manager to assure a timely response to changing service and program needs.</td>
</tr>
<tr>
<td><strong>Multiple reviews required/four or more times per year (3)</strong></td>
</tr>
<tr>
<td>Because the client's status, mental, physical and/or social/environmental, is subject to rapid change, particularly negative, his needs and treatment plan require close attention from the case manager.</td>
</tr>
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<tr>
<th>COORDINATION (ENTER 0, 2, or 3)</th>
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<tbody>
<tr>
<td><strong>No provider coordination required (0)</strong></td>
</tr>
<tr>
<td>The client and/or his/her support system is able independently to assure the receipt of integrated and comprehensive services with little or no assistance from the case manager.</td>
</tr>
<tr>
<td><strong>Minimum provider coordination required/non-problematic (2)</strong></td>
</tr>
<tr>
<td>The case manager monitors the progress and receipt of services to assure that the plan is being implemented appropriately. However, because either few services are needed or the client and/or the support system assumes considerable responsibility, the case manager does not need to intervene actively on the client's behalf to correct, revise or clarify providers' roles and activities.</td>
</tr>
<tr>
<td><strong>Multiple provider coordination required/few providers - extensive communication to be required (3)</strong></td>
</tr>
<tr>
<td>Extensive intra-agency communication and intervention is required to provide accessibility to services and to assure an integrated plan of services. The major responsibility lies with the case manager to initiate contacts, negotiate for services, and monitor frequently the client's progression in services. Resource development and advocacy is necessary.</td>
</tr>
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<tr>
<td><strong>Minimal (0)</strong></td>
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<td>The case manager is located geographically close to the client and typically spends little time traveling to the client for visits.</td>
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<td><strong>Moderate (2)</strong></td>
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<td>The case manager may be located 10 to 20 miles from the client and the case manager typically spends no more than 30 minutes traveling to and from the client.</td>
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<td><strong>Maximum (3)</strong></td>
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<tr>
<td>The client lives 30 or more miles from the case management resource and travel time of one hour or more is required for face-to-face contacts.</td>
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Resources for Searching

George Gergis, Senior Investigator, ISU

Permission to reprint this excerpted list is kindly given by ISU. Please contact them for even more or any questions. The JNLC makes no representation as to completeness or accuracy but hopes that this list will be useful in your practice.

**Phone Directories.**
- [www.addresses.com](http://www.addresses.com)
- [www.infospace.com](http://www.infospace.com)
- [www.phonenumber.com](http://www.phonenumber.com)
- [www.findnumber.net](http://www.findnumber.net)
- [www.whitepages.com](http://www.whitepages.com)
- [www.worldyellowpages.com](http://www.worldyellowpages.com)
- [www.yellowpages.com](http://www.yellowpages.com)
- [www.ypo.com](http://www.ypo.com)
- [www.phonenumber.com](http://www.phonenumber.com)

Online yellow and white pages
- [www.reversephonedirectory.com](http://www.reversephonedirectory.com)

Reverse lookup
- [www.theultimates.com](http://www.theultimates.com)

White and yellow pages, email search
- [www.anywho.com](http://www.anywho.com)
- [www.bigfoot.com](http://www.bigfoot.com)
- [www.555-1212.com](http://www.555-1212.com)

Electronic Haynes telephone directory, with reverse look up
- [www.att.com/directory](http://www.att.com/directory)
- [www.411.com](http://www.411.com)
- [www.bigbook.com](http://www.bigbook.com)
- [Worldwide yellow pages](http://www.bigbook.com)
- [www.canada411.ca/](http://www.canada411.ca/)

Canada 411
- [www.lincmad.com](http://www.lincmad.com)

Telephone area codes and splits
- [www.city.net](http://www.city.net)
- [www.globeexplore.com](http://www.globeexplore.com)
- [www.indo.com/distance/](http://www.indo.com/distance/)

Mileage calculator
- [www.mapblast.com](http://www.mapblast.com)
- [www.mapquest.com](http://www.mapquest.com)
- [www.mapsonus.com](http://www.mapsonus.com)

Electronic address look-ups, will also provide directions.
- [www.maps.yahoo.com](http://www.maps.yahoo.com)
- [www.reversephonedirectory.com](http://www.reversephonedirectory.com)
- [www.reversephonedirectory.com](http://www.reversephonedirectory.com)

National Hurricane Center
- [www.nhc.noaa.gov](http://www.nhc.noaa.gov)

National Oceanic & Atmospheric Administration
- [www.weather.com](http://www.weather.com)

The Weather Channel
- [www.weatherins.com](http://www.weatherins.com)

Worldwide weather
- [www.weather.com](http://www.weather.com)

Weather
- [www.accuweather.com](http://www.accuweather.com)
- [www.compuweather.com](http://www.compuweather.com)
- [www.wunderground.com](http://www.wunderground.com)

National weather maps
- [www.intellicast.com](http://www.intellicast.com)

National & International weather
- [www.nhc.noaa.gov](http://www.nhc.noaa.gov)

National Hurricane Center
- [www.noaa.gov](http://www.noaa.gov)

National & International weather
- [www.weather.com](http://www.weather.com)

The Weather Channel
- [www.weatherins.com](http://www.weatherins.com)

Worldwide weather

Find People

Social Security death index, ancestry search
- [www.ancestry.com](http://www.ancestry.com)

Locate people
- [www.anywho.com](http://www.anywho.com)
- [www.whowhere.com](http://www.whowhere.com)
- [www.voompeople.com](http://www.voompeople.com)
- [www.peoplesearch.com](http://www.peoplesearch.com)
- [www.peoplefinders.com](http://www.peoplefinders.com)
- [www.masterfiles.com](http://www.masterfiles.com)
- [www.infospace.com](http://www.infospace.com)
- [www.isearch.com](http://www.isearch.com)
- [www.reunion.com](http://www.reunion.com)
- [www.search.com](http://www.search.com)

Ancestry search
- [www.familytreemaker.com](http://www.familytreemaker.com)
- [www.myfamily.com](http://www.myfamily.com)

Missing children network
- [www.lostchildren.org](http://www.lostchildren.org)

People / email search
- [www.iaf.net](http://www.iaf.net)

General Resources
- [www.altavista.com](http://www.altavista.com)
- [www.dogpile.com](http://www.dogpile.com)
- [www.cyber411.com](http://www.cyber411.com)
- [www.excite.com](http://www.excite.com)
- [www.go.com](http://www.go.com)
- [www.google.com](http://www.google.com)
- [www.icerocket.com](http://www.icerocket.com)
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- [www.researchbuzz.com](http://www.researchbuzz.com)
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- [www.ask.com](http://www.ask.com)
- [www.hotbot.com](http://www.hotbot.com)
- [www.brbpub.com](http://www.brbpub.com)
- [www.fosson.com](http://www.fosson.com)

Public Records searches
- [www.publicdata.com](http://www.publicdata.com)
- [www.publicrecordfinder.com](http://www.publicrecordfinder.com)
- [www.searchytems.net](http://www.searchytems.net)
- [www.digitalcity.com](http://www.digitalcity.com)
- [www.goto.com](http://www.goto.com)

Mobile phone user search engine
- [www.usps.com](http://www.usps.com)

United States Postal Service-ZIP codes
- [www.wikipedia.org](http://www.wikipedia.org)

Online encyclopedia
- [www.wordmagic.com](http://www.wordmagic.com)

Online Translator

Military searches
- [www.airforce.com](http://www.airforce.com)

Air Force website

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<td>Military records</td>
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<td><a href="http://www.ssg.gov/hist.htm">www.ssg.gov/hist.htm</a></td>
<td>Selective service history &amp; records</td>
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<td><a href="http://www.vets.org">www.vets.org</a></td>
<td>Veteran news &amp; search</td>
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<td><a href="http://www.webgator.org">www.webgator.org</a></td>
<td>Verifies the military status of any person</td>
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<td>INSURANCE</td>
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<td><a href="http://www.aais.org">www.aais.org</a></td>
<td>American Assn. of Insurance Services</td>
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<td>Assn. of Professional Insurance Women</td>
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<td><a href="http://www.claimspages.com">www.claimspages.com</a></td>
<td>Search engine</td>
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<td><a href="http://www.hiaa.org">www.hiaa.org</a></td>
<td>Health Insurance Assn. of America</td>
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<td><a href="http://www.hmopage.com">www.hmopage.com</a></td>
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<td><a href="http://www.hwysafety.org">www.hwysafety.org</a></td>
<td>Insurance Institute for Highway Safety</td>
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<td><a href="http://www.ultimateinsurancelinks.com">www.ultimateinsurancelinks.com</a></td>
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<td>Assn. of Certified Fraud Examiners</td>
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<td>Identity theft</td>
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<td>International Assn. of Industrial Accidents</td>
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<td><a href="http://www.firstline.com">www.firstline.com</a></td>
<td>National Criminal Records Search</td>
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<td>Insurance Fraud Bureau</td>
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<td>Federal Inspectors General</td>
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<td>Coalition Against Insurance Fraud</td>
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<td>Due diligence &amp; fraud investigation</td>
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<td>Accident and Vehicle Reconstruction</td>
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<td>Accident reconstruction site</td>
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<td>Trucking safety/accident reconstruction</td>
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<td><a href="http://www.highwaysafety.org">www.highwaysafety.org</a></td>
<td>Institute for Highway Safety</td>
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<td><a href="http://www.tarorigin.com">www.tarorigin.com</a></td>
<td>Traffic Accident Reconstruction</td>
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<td>FEDERAL &amp; STATE AGENCIES &amp; COURTS</td>
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<td><a href="http://www.access.gpo.gov/nara/index.html">www.access.gpo.gov/nara/index.html</a></td>
<td>Code of Federal regulations</td>
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<td>Confidential Investigations &amp; Surveillance</td>
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<td><a href="http://www.InvestigativeSupportUnit.com">www.InvestigativeSupportUnit.com</a></td>
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<td><a href="http://www.isu-net.com">www.isu-net.com</a></td>
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<td><a href="mailto:Ggergis@isu-net.com">Ggergis@isu-net.com</a></td>
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<td>Toll Free: 888-733-3009</td>
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www.inmatelocater.com
Criminal records
www.kruglaw.com
Criminal Law research
www.nsopr.gov
National Sex Offender Search
www.officer.com
Police & Law Enforcement website
www.usacops.com
Law enforcement website
 www.vaonline.org
Victim assistance website
 www.vinelink.org
Inmate search

CORPORATE INFORMATION
www.ceoexpress.com
Corporate news & financial information
www.cfonews.com
Corporate Financials online
www.companylink.com
Research & contacts for public companies
www.hoovers.com
Information on public companies
www.integrainfo.com
Information on private companies

MEDICAL
www.aaos.org
American Academy of Orthopedic Surgeons
www.ahcpr.gov
Healthcare Research & Quality
www.ama-assn.org
American Medical Assn.
www.amerchiro.org
American Chiropractic Assn.
www.cancer.org
American Cancer Society
www.cdc.gov
Center for Disease Control
www.centerwatch.com
Clinical trials listing
www.certifieddoctor.org
Verify Dr. through American Board of Medical Specialists
www.chiroweb.com
Chiropractic web site
www.doctorpage.com
Doctor Directory
www.elderconnect.com
Extended Care info network
www.familiesusa.org
Voice for health care consumers
www.foodallergy.org
The Food Allergy Network
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Medical search engine
www.healthgate.com
Document management for the Health industry
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Medical search engine
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Medical search engine
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Merck manual
www.mwsearch.com
Medical world search
www.nih.gov
National Institute of Health
www.rwjf.org
Robert Wood Johnson Medical Foundation
www.rxlist.com
Internet drug search
www.tabers.com
Medical dictionary
www.webmd.com
Medical search engine
www.who.ch
World Health Organization

SECTION 2

STATE HOME PAGES
www.state.az.us
Arizona home page
To access other states, substitute the 2-letter state abbreviation for “az”
Access and links to State courts, government, Environmental Protection, legislative bodies and members, EMS, taxpayers associations, Depts of Education, Insurance, Professional Licensure, Labor, Vocational Rehab, Corrections, Industrial Accidents, Health, Public Records Archives, etc., etc.

PROPERTY RECORDS AND RECORDERS OFFICES
Midwest area Tapestry
Multiple State property records and searches
http://www.macoggis.com/
GIS multiple counties Indiana

PUBLIC RECORD INDEX SITES:
http://publicrecordsources.com
http://publicrecordcenter.com/
http://www.blackbookonline.info/
Study Protocol: Cost-effectiveness of an integrated “fast track” rehabilitation service for multi-trauma patients involving dedicated early rehabilitation intervention programs: design of a prospective, multi-centre, non-randomised clinical trial

Sevginur Kosar, Henk AM Seelen, Bena Hemmen, Silvia MAA Evers, and Peter RG Brink

In conventional multi-trauma care service (CTCS), patients are admitted to hospital via the accident & emergency room. After surgery they are transferred to the IC-unit followed by the general surgery ward. Ensuing treatment takes place in a hospital’s outpatient clinic, a rehabilitation centre, a nursing home or the community. Typically, each of the CTCS partners may have its own more or less autonomous treatment perspective. Clinical evidence, however, suggests that an integrated multi-trauma rehabilitation approach (“supported Fast-Track Multi-Trauma Rehabilitation Service,” SFTRS), featuring: 1) earlier transfer to a specialised trauma rehabilitation unit; 2) earlier start of “non-weight-bearing” training and multidisciplinary treatment; 3) well-documented treatment protocols; 4) early individual goal-setting; 5) co-ordination of treatment between trauma surgeon and physiatrist, and 6) shorter lengths-of-stay, may be more (cost-)effective.

This paper describes the design of a prospective cohort study evaluating the (cost-)effectiveness of SFTRS relative to CTCS.

Methods/design
The study population includes multi-trauma patients, admitted to one of the participating hospitals, with an Injury Severity Scale score \( \geq 16 \), complex multiple injuries in several extremities or complex pelvic and/or acetabulum fractures. In a prospective cohort study CTCS and SFTRS will be contrasted.
The inclusion period is 19 months. The duration of follow-up is 12 months, with measurements taken at baseline, and at 3, 6, 9 and 12 months post-injury.

Primary outcome measures are quality of life (SF-36) and functional health status (Functional Independence Measure, FIM). Secondary outcome measures are the Hospital Anxiety & Depression Scale, the Mini-Mental State Examination as an indicator of cognitive functioning, and the Canadian Occupational Performance Measure measuring the extent to which individual ADL treatment goals are met. Costs will be assessed using the PROductivity and DISease Questionnaire and a cost questionnaire.

Discussion
The study will yield results on the efficiency of an adapted care service for multi-trauma patients (SFTRS) featuring earlier (and condensed) involvement of specialised rehabilitation treatment. Results will show whether improved SFTRS logistics, combined with shorter stays in hospital and rehabilitation clinic and specialised early rehabilitation training modules are more (cost-) effective, relative to CTCS.

Trial registration
Current Controlled Trials register (ISRCTN68246661) and Netherlands Trial Register (NTR139).

Introduction
In the Netherlands, with a population of approximately 16 million people, every year about 99,000 persons are admitted to hospital after an accident, whereas 880,000 people visit the Accident & Emergency department (A&E) after an accident [1]. These accidents lead to considerable societal costs. Direct medical costs are estimated at 1 billion Euro/year, i.e. 3–4% of the total Dutch health care budget. Production losses due to acute trauma are estimated at 4 billion Euro (US $5.147 billion), thus widely surpassing costs of chronic illness like cardiovascular diseases and cancer [2-4]. Many of the patients have multiple fractures. Major causes of multi-trauma are traffic accidents, accidents at work, (extreme) sports, falls, blasts, etc. [5]. The legs (incl. pelvis) are most frequently injured in multi-trauma [6-9]. Multi-trauma occurs more often in males and in younger adults [5]; [10]. Many patients are at an age where they have a paid job. Furthermore, the rehabilitation of the multi-trauma patients may take a long time. The societal impact of multi-trauma is therefore large.

Medical care for trauma patients is a combined responsibility of hospitals, ambulance services, trauma centres, rehabilitation clinics and GHOR (medical assistance after accidents and disasters). This co-operation between teams of specialists is called “trauma care chain” (TCC). In the present study multi-trauma is defined as having 2 or more injuries of which at least 1 is life threatening, including trauma with an Injury Severity Scale (ISS) score >= 16; complex multiple injuries on both lower extremities; a combination of 1 upper and 1 lower extremity injury, the latter of which can not continue next page
be used in load-bearing; or complex pelvis/acetabulum fractures. Several tools for rating trauma severity have been designed [11]. The ISS [12,13] is used most often.

In conventional multi-trauma care service (CTCS) each of the partners has its own more or less autonomous treatment perspective, depending on the professional’s individual treatment views and experience. Clinical evidence, however, suggests that an integrated multi-trauma rehabilitation service approach or “Supported Fast Track Multi-Trauma Rehabilitation Service” (SFTRS), featuring:

- Earlier involvement of the rehabilitation physician in the hospital
- Shorter stay in hospital and earlier transfer of multi-trauma patients to a specialised trauma rehabilitation unit
- An earlier start of both specific physical and psychosocial treatment provided by a multidisciplinary team
- Early individual goal setting
- Early start of psychological and social counselling;
- A integrated co-ordination of treatment between the trauma surgeon and the rehabilitation physician, and
- A shorter stay in a trauma rehabilitation unit may be more (cost-)effective. Such SFTRS approach may lead to less secondary complications associated with immobilisation, which would negatively influence recovery and quality of life. Early personalised goal setting and early treatment of depression are known to positively affect outcome. SFTRS may lead to faster reintegration into society. Early return to work and active support from the multidisciplinary rehabilitation team will lead to a more stable social network, and the patient becoming less reliant on professional care in the long term. Also, the SFTRS may reduce the length of stay of multi-trauma patients in a hospital. Furthermore, earlier rehabilitation treatment in a specialised rehabilitation unit may also reduce the length of stay in the rehabilitation clinic, thus reducing costs of hospital/clinic consumption. At this moment it is not possible to make a precise calculation of these savings. Since earlier discharge also means that patients take part in society and work earlier, costs related to production losses and patient & family costs are expected to be lower.

The main objective of this study is to examine the effectiveness, costs and cost-effectiveness of an integrated care service for multi-trauma patients, continued next page
The general research question is:

Which of 2 rehabilitation services, i.e., “Conventional Multi-Trauma Care Service” (CTCS) or “Supported Fast Track Multi-Trauma Rehabilitation Service” (SFTRS), is most (cost-)effective from a societal point of view?

Sub-questions are:

- What are the effects of the SFTRS on generic quality of life in multi-trauma patients as compared to the CTCS?
- What are the effects of the SFTRS on functional health status as compared to the CTCS?
- What are the costs to health care and to society of the SFTRS as compared to the CTCS?
- What is the cost-effectiveness of the SFTRS as compared to the CTCS?

The general hypothesis of this study is that SFTRS is more (cost-)effective than CTCS.

Methods

Design

This study is a prospective, multi-centre, non-randomised clinical trial in which two multi-trauma rehabilitation services will be contrasted, i.e. “Conventional Trauma Care Service” (CTCS) and “Supported Fast Track Multi-Trauma Rehabilitation Service” (SFTRS). The patients will be followed for 12 months (see flow chart, Fig.1, below left). The inclusion time is 19 months.

Prior to participation, informed consent will be obtained from all participants.

All protocols used in this study have been approved by the Medical Ethics Committee of the Rehabilitation Foundation Limburg in Hoensbroek, the Netherlands.

This study is registered at the Current Controlled Trials register (ISRCTN68246661) as well as at the Netherlands Trial Register (NTR1391).

Population

Multi-trauma patients admitted to one of the accident & emergency departments (A&E) of the participating hospitals are included. Multi-trauma is defined as having at least 2 or more injuries of which at least 1 is life threatening, including a) trauma with an Injury Severity Scale score ISS >= 16, b) complex multiple injuries on both lower extremities, c) a

continued next page
A combination of one upper and one lower extremity injury, the latter of which can not be used in load-bearing, or d) complex pelvis/acetabulum fractures (for in- and exclusion criteria see Table 1 above).

Participants for the SFTRS will be recruited in the adherence of the trauma centre in the south of the Netherlands. The reference group will be recruited in the adherence of one of the other trauma centres in the Netherlands. The inclusion of the participants will start in October 2008 and will continue until May 2010. Both medically and ethically it is not feasible to randomise the acute multi-trauma patients across the two trauma centres mainly due to geographical distances. Therefore, a non-randomised controlled clinical trial is used.

Table 1  Inclusion and exclusion criteria
Inclusion criteria
• Age >= 18 years
• Multi-trauma (as defined above)
• Hospitalisation after A&E* admission
• Rehabilitation indication, i.e. lasting impairments or handicaps are expected
• Adequate Dutch language skills

Exclusion criteria
• Severe alcohol and/or drug abuse
• Severe psychiatric problems

* A&E: Accident and Emergency room

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Based on the 2005–2007 databases from the participating centres, the influx numbers for the SFTRS group and the CTCS group are expected to amount to about 364/year and 370/year respectively. Prospective data from a pilot study in 2008 showed that, within 3.5 months, in each of the two centres 86 multi-trauma patients were admitted to the A&E. Given an inclusion period of 19 months, approximately 467 patients in each of the respective regions are expected, totalling 934 for this study (see flow chart, Figure 1).

To date, no exact data on differences in quality of life outcome between different treatment services for multi-trauma patients are available. Czyrny and co-workers [14] report an improvement in motor FIM score of 30.2 in a small group of bilateral lower limb multi trauma patients having received both hospital and subsequent rehabilitation treatment, at a mean length of stay of 62.8 (+/-6.0) days. In order to detect a difference of 15% of such improvement in FIM score between SFTRS and CTCS at T1 (assuming a two-sided significance level of 0.05, a power of 80%, and a common standard deviation (sd) of 9.5 as reported by Czyrny [14]), 71 persons per group are needed. Taking into account a 15% loss to follow-up, the required sample size is 82 persons per group (164 persons in total).

Interventions/services
SFTRS involves the following:
• The rehabilitation physician from the rehabilitation centre is routinely involved at a very early
stage post-trauma. This allows an early start for multidisciplinary rehabilitation treatment

- Early transfer (within five days after having been added to the waiting list from the rehabilitation centre) to a centralised, specialised trauma rehabilitation unit equipped with facilities for early training programs
- Early individual rehabilitation goal setting
- Close cooperation and exchange of views and experiences between the trauma surgeon and the rehabilitation team by, for example, monthly clinical sessions and individual patient visits by the trauma surgeon in the first weeks after discharge;
- Well-documented treatment protocols for multi-trauma patients for both the hospital and rehabilitation centre phases.

Three phases can be identified in the treatment of multi-trauma patients:

- Phase 1 Early rehabilitation
- Phase 2 Stage II rehabilitation
- Phase 3 Discharge or post-discharge

**Phase 1: Early rehabilitation** In the early rehabilitation phase, the patient is not allowed to bear weight. Consequently, the physiotherapist is concerned with maintaining joint mobility, muscle strength, sitting balance, condition and training transfers as well as treatments with non-weight-bearing conditions such as hydrotherapy and non-weight-bearing gait training. There are 10 sessions per week of 30 minutes each. In addition, fitness, gymnastics, table tennis, swimming, bowling, hand bike, wheelchair training, and archery are given.

There are 2–3 sessions per week for each treatment modality of 60 minutes each. The occupational therapist advises on bed posture, mattress types, aids for independent daily self-care, wheelchair-dependency training and meaningful activities that can be performed while wheelchair-bound. In addition, the wheelchair accessibility and wheelchair-friendliness of the patient’s home are studied. If necessary, written and oral advice on temporary and long-term adaptations to the home is given and support is given and the patient is helped to apply for financial support so that the patient can return home as soon as possible. At first, this would be for a day or two at the weekend, supervised by an occupational therapist, but would later become permanent.

With regard to work, the patient’s job is analysed and the patient’s workplace is visited. There are 4 sessions per week of 30 minutes each.

The social worker and the psychologist will see every multi-trauma patient within the first week after admission. The social worker helps the patient to return home by dealing with the family and offering advice and support to the patient on financial matters, transport facilities. The social worker also contacts the employer and company doctor to look
into the possibility of reintegrating the patient into their present job.

The psychologist will examine the patient with regard to such conditions as mood disorders, post-traumatic stress syndrome (PTSS), acceptance problems and cognitive problems. The latter requires extensive neuropsychological testing. In addition, individual and group psychological counseling and specialised treatment for PTSS are given. If necessary, the rehabilitation specialist can refer the patient to a consultant in psychiatry, a consultant in neurology, a consultant in internal medicine, a consultant in rheumatology and/or a consultant in urology, who is affiliated to the rehabilitation centre.

**Phase 2: Stage II rehabilitation** In Stage II, new treatment aims are added by the physiotherapist. These might include a gradual individual weight bearing scheme, coordination training, and functional training. There are 7 therapy sessions per week of 30 minutes. In addition, fitness, gymnastics, table tennis, swimming, rowing, cycling and archery are given. This is offered in 2–4 sessions per week for each treatment modality of 60 minutes each.

The occupational therapist continues with the treatment goals as mentioned for phase I and trains the patient to perform household tasks, hobbies, etc in a home-like environment. There are three sessions per week of 30 minutes each. In addition, group therapies such as occupational therapy and recreational therapy are given 2–4 times per week each.

The social worker and the psychologist continue the work mentioned in phase I, depending on the individual needs of each patient.

**Phase 3: (Post) discharge** In the discharge phase, the patient is prepared for living at home and is referred to local physiotherapists, specialised sport clubs and mental health care professionals.

**Conventional Multi-Trauma Care Service**

CTCS is provided in several centres. Multi-trauma patients are admitted to hospital via the A&E department. After possible surgery, they are transferred to the IC-unit, followed by the hospital’s nursing ward, where the patient may stay for several days or weeks. The trauma surgeon, as chief consultant, decides whether or not a rehabilitation physician will be consulted during hospitalisation. Next, ensuing treatment may take place in the hospital’s outpatient clinic, in a rehabilitation centre, in a nursing home or with a local GP or physiotherapist. Van Vree and coworkers [15] reported that, typically, each of the CTCS “stages” might have its own more-or-less autonomous treatment perspective, depending on the professional’s individual treatment views and experience.

The effectiveness of multi-trauma rehabilitation interventions and its constituting elements has been established in numerous studies. Recently, Holtslag [16], in his PhD research, investigated the long term outcome after major trauma. However, continued next page
whereas most clinical studies compare single treatment outcome, no randomised clinical trials on treatment effects in multiple trauma patients have been found to date.

Data collection
Baseline measurements will be administered as soon as possible post-injury (= T0). Further measurements will be taken at 3 months (= T1), 6 months (= T2), 9 months (= T3) and 12 months (= T4) post-trauma (see also flow chart, Fig.1).

Demographic and medical variables
Upon arrival at the A&E (= T0) the following variables will be recorded: age, gender, medical history, medication usage, diagnosis, ISS score, date and time of trauma and Glasgow Coma Scale (GCS).

As soon as possible post-injury the following data are collected: trauma treatment, possible complications (description, number and extend) and time in hospital. The following additional data are recorded upon admission in the rehabilitation centre: individual rehabilitation treatment aims, pre-trauma psychosocial status and pre-trauma employment status.

Outcome measures
Outcome measures are presented in Table 2.

Primary outcome measures
In the current study the primary outcome measures are FIM, measuring quality of life and SF-36, measuring functional health status. In several studies it was found that in multi-trauma patients quality of life and functional recovery do not solely depend on injury severity and complications [6-9], but also on psychological and social factors (e.g. [5,17-20]) as well as the patient’s cognitive status [21]. The Functional Independence Measure (FIM) is widely used in assessing functional health status in different groups of patients. Baldry-Currens [22,23] recommended using the FIM in assessing trauma outcome, the FIM correlating high with measures of injury severity and demonstrating clinical and statistical significance. Similarly, Hetherington and co-workers [24,25] reported that in rehabilitation services, the FIM is a useful, practical and simple methodology, providing a measure for assessing the original disability, its progress and residual limitations. The National Trauma Data Bank collects data

### Table 2 Primary and secondary outcome measures

**Primary outcome measures**
- Generic quality of life (SF-36)
- Functional health status (FIM)

**Secondary outcome measures**
- Anxiety and depression (HADS)
- Cognitive functioning (MMSE)
- Extent to which individual ADL treatment goals are met (COPM)

Note: Costs will be assessed using the PRODISQ, a cost questionnaire and hospital database data

FIM: Functional Independence Measure  
COPM: Canadian Occupational Performance Measure  
HADS: Hospital Anxiety and Depression Scale  
MMSE: Mini-Mental State Examination  
PRODISQ: PROductivity and DISease Questionnaire

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on trauma centre performance throughout the USA. As to functional outcome assessment in trauma patients FIM data are used [26].

At an international and interdisciplinary consensus conference in 1999 about the assessment and application of quality of life (QoL) measures after multiple trauma, experts clinicians and methodologists agreed on the SF-36 as generic tools for QoL assessment across all trauma patients [27]. In the proposed study both generic QoL and utilities will be derived using the SF-36. An overall utility score for population based QoL can be obtained, which facilitates comparisons with other interventions, i.e. the social tariff of the SF-36 [28-33].

Secondary outcome measures
The Canadian Occupational Performance Measure (COPM) is an individualised client-oriented measure to assess the evolution of self-perception of skills in patients across time [34,35]. The COPM was, for example, used by Trombly and co-workers [36] to investigate the association between participation in goal-specific outpatient occupational therapy and improvement in self-identified goals in adults with acquired brain injury. In our study the COPM will be used to assess the extent to which individual treatment aims of the multi-trauma patient, set during rehabilitation, are met.

The Hospital Anxiety and Depression Scale (HADS) gives clinically meaningful results as a psychological screening tool, in clinical group comparisons and in correlational studies with several aspects of disease and quality of life. It is sensitive to changes both during the course of diseases and in response to psychotherapeutic and psychopharmacological intervention. Finally, HADS scores predict psychosocial and possibly also physical outcome [37]. The HADS has been used by Kempen and colleagues [38] to investigate the effect of depressive symptoms on the recovery of activities of daily living after fall-related injuries to the extremities in older persons. As stated before, anxiety and depression, among others, may influence therapy outcome in multi-trauma rehabilitation. Therefore, in the present study the HADS is used to assess this aspect. The Mini-Mental State Examination (MMSE) is a test that briefly surveys global mental status in a wide range of cognitive domains [39-41]. Jackson and co-workers [39] used the MMSE in trauma survivors without intracranial haemorrhage. Their findings corroborated earlier research stating that these patients display persistent cognitive impairment associated with functional defects, poor quality of life, and an inability to return to work [39]. In our study the MMSE will be used similarly, i.e. to assess global cognitive functioning of multi-trauma patients.

Treatment credibility and expectancy
In studies comparing the effectiveness of different treatment regimes, differences in treatment credibility and expectancy may influence the outcome. In the proposed study the credibility/expectancy questionnaire (CEQ) [42] will be administered directly
following the explanation of the study’s rationale to patients, i.e. after informed consent has been obtained.

**Determination of costs**

*General considerations:* For the economic evaluation the *main research question* is:

*From the viewpoint of the society is another organisation of professional care service for trauma patients (i.e. SFTRS) compared to CTCS preferable in terms of costs, effects and utilities?*

Based on this main research question several *sub-questions* are relevant:

1) What are the costs of SFTRS compared to CTCS preferable in terms of costs, effects and utilities?

2) What are the extra effects (measured in quality of life, utilities, and saving by reducing inpatient hospital admissions of multi-trauma patient) of SFTRS compared to CTCS preferable in terms of costs, effects and utilities?

We hypothesise that SFTRS is associated with a reduction in health care and patient costs, and an improvement in quality of life, compared to CTCS.

We hypothesise that SFTRS is associated with a reduction in health care and patient costs, and an improvement in quality of life, compared to CTCS.

- **Health care costs:** cost of the intervention program and other health care resources both by the patient and the caregiver.
- **Patient and family costs:** informal care, paid domestic help, transportation, over the counter medication, and other out-of-pocket expenses.
- **Productivity losses:** absenteeism, presenteeism (loss of productivity while at work), and compensation mechanisms for both the patient and the caregiver, if relevant.

**Measurement of volumes:**

- Hours spent on the intervention program will be recorded on a pre-structured form by the acting healthcare professionals.
- All other health care costs and patient & family costs will be recorded in a cost questionnaire
- Production losses will be measured using the patient modules of the PRODISQ [43,44]

The PRODISQ will be used together with the costs questionnaire, every 3 months at baseline and T1 through T4.

For the valuation of health care costs and patient & family costs, an update of the Dutch manual for costing in economic evaluations [45] will be used.

*continued next page*
For care for which no costs-guidelines are available estimations of the costs will be made, based on the real costs and/or on population based estimates from literature. Valuation of production losses will be based on a modification of the friction cost method.

Both generic Quality of life (QoL) and utilities are derived from the SF-36. An overall utility score for population based QoL can be obtained, which facilitates comparisons with other interventions, i.e. the social tariff of the SF-36 [28-33].

The primary outcome measure for the cost-effectiveness analysis will be FIM. The primary outcomes measure for the cost-utility measure will be utilities based on the SF-36 social tariff.

The time horizon is 12 months. Ratios will be determined, based on incremental costs and effects of SFTRS compared to CTCS. The cost-effectiveness ratio will be stated in terms of costs per improvement on the FIM. The cost-utility ratio will focus on the net cost per QALY gained. Bootstrap resampling techniques [46,47] are used to explore cost-effectiveness uncertainty.

Sensitivity analyses will be performed for the costs that turn out to have the largest impact on the differences in total costs between SFTRS and CTCS. In these analyses both the variance in volumes and prices will be considered. The range over which uncertain factors are thought to vary will be assessed by calculating a minimum and maximum (mean value of costs minus or plus the SD).

**Statistical analyses**

In non-randomised comparative studies, variations in case mix between centres can influence the interpretation of outcome data [48]. Therefore, for each of the data sets collected at T1 through T4, differences in outcome variable between the 2 services will be tested using multiple MANCOVAs, entering various indicators of case mix as co-variates, i.e. age, gender, ISS, number of complications, pre-trauma psycho-social status.

When patients drop out of the study, the reason for their withdrawal will be recorded. Drop-outs may bias the treatment effect evaluations. Therefore, the following regime will be applied:

- Missing T4 measurement: “last-observation-carried-forward” principle will be applied.
- Missing T3 or T2 measurement: linear interpolation of data using data from adjacent time points (e.g. T1 and T4) for imputation.
- Missing T0 or T1 measurement or more than 2 missing measurements: discarding of patient data and influx of additional patient in order to meet n = 82 per group.

**Discussion**

The main objective of this study is to examine the effectiveness, the costs and the cost-effectiveness of an integrated Supported “Fast Track” Rehabilitation Service for multi-trauma patients (SFTRS) involving dedicated early rehabilitation intervention programs.
As there are no publications found about contrasts in (cost-)effectiveness between different multi-trauma rehabilitation services it is important to investigate whether a new rehabilitation service is more effective than the conventional service.

During the conceptualisation of the study design several choices had to be made. The major ones will be discussed here.

First, randomisation in this study is not possible because of practical and ethical reasons. The distance between the two centres is approximately 150 km. Since this study includes acute (complex) multi-trauma patients who need to be take care of as soon as possible it is not justified to transport patients for hours to accommodate to any randomisation procedure.

Second, in literature the “severe multi-trauma” patients are frequently reported as having at least 2 or more injuries of which at least 1 is life threatening (ISS > = 16). However, during a pilot study it became apparent that part of the multi-trauma patients suffering from complex multiple injuries and who were admitted to the rehabilitation centre had an ISS < 16. Clinically speaking, it concerned patients suffering from one of the following injuries: a) complex multiple injuries on both lower extremities; b) a combination of one upper and one lower extremity injury, the latter of which could not be used in load-bearing; or c) complex pelvis/acetabulum fractures. Multi-trauma patients, who often suffer from skull and brain injuries, generally have an ISS > = 16. However, especially in complex pathology of the locomotor system, necessitating intensive rehabilitation training, the AIS system often scores less. Given the fact that these patients do participate in CTCS and SFTRS, indicating that they do belong to the target population in accordance with the other inclusion criteria, these patients have been added to the project population. This classification of multi-trauma patients is in accordance with the revised AIS coding ("AIS upgrading") which is currently being elaborated internationally.

In the present study the definition of multi-trauma reads: "Multi-trauma is defined as having at least 2 or more injuries of which at least 1 is life threatening, including a) trauma with ISS > = 16, b) complex multiple injuries on both lower extremities, c) a combination of one upper and one lower extremity injury, the latter of which can not be used in load-bearing, or d) complex pelvis/acetabulum fractures."

In conclusion, this paper describes the design of a prospective, multi-centre, non-randomised clinical
trial that will investigate the (cost-) effectiveness of a new Supported Fast Track Multi-Trauma Rehabilitation Service (SFTRS). The inclusion of the patients will start in October 2008 and will continue until May 2010. The results of this study will give evidence whether the new “fast track” rehabilitation service for multi-trauma patients is more effective than the conventional care service, and thus should be introduced nationwide.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
SK is the main researcher and has conceptualised this paper together with HS. HS has written the protocol for this study and is also the project leader of this study. BH, HS and PB originated the idea for the study. SE has co-written the study protocol regarding the cost aspects. HS and BH are the supervisors of SK. The promoter of SK is PB.

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The authors (2007) previously advanced the adaptation and use of life care planning as a structured, dynamic method for rehabilitation programs with combat veterans with post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI) within the Department of Veteran Affairs (VA) polytrauma programs. The VA’s polytrauma programs provide comprehensive acute and long-term rehabilitation services for service members and veterans who have experienced both physical and mental injury as a result of a range of traumatic exposure, including combat, motor vehicle accidents, and other hazards (Lew et al., 2008; Sayer et al., 2008). We previously explored the use of Life Care Planning to facilitate continuity of care, accurately identify current and future medical and mental health needs, and coordinate care across institutions and geographic locations. Our recommendations for the adaptation and use of Life Care Planning with this population are partly based on the complex and fragmented system of care.

In addition, the medical and psychiatric conditions of PTSD and TBI may require lifelong care coordination, as these disorders can negatively impact the patient’s family relationships (Kennedy et al., 2007), occupational (Martin, Marchand, & Boyer, 2009), and overall physical health status (Lin et al., 2010; Schnurr et al., 2006). This article describes PTSD and TBI diagnostic criteria and prevalence. Our primary goal is to raise Life Care Planners’ awareness of potential complications and implications for medical adherence and long-term recovery.

Post-traumatic Stress Disorder (PTSD)
Post-traumatic stress disorder (PTSD) is a unique psychiatric condition, because the diagnosis requires an emotional or physically traumatic lifetime occurrence. Exposure to unfortunate and potentially debilitating traumatic stressors, such as sexual or physical assault, natural or man-made disasters, criminal violence and combat, can have a lasting

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psychological and physiological impact. After experiencing an event that involves threat of death or injury to themselves, witnessing trauma to another, or learning about the traumatic experience of another person, some people respond with intense fear, helplessness, or horror, and subsequently develop PTSD. One of the core PTSD symptoms is unwanted intrusive traumatic memories manifested as nightmares or daytime flashbacks. Additionally, individuals diagnosed with PTSD may suffer as if the danger associated with the traumatic event continued. Triggered emotional responses to events, places, people or anniversaries of the trauma may lead to intense emotional outbursts. PTSD also includes active and passive avoidance of painful or upsetting reminders, and hyper-arousal (vigilance, startle, insomnia) with activated alertness toward the recurrence of danger. Individuals may also experience difficulties with attention and everyday memory, perhaps due to the influence of intrusive cognitive activity.

While many studies have examined cognitive and neuropsychological functioning in individuals with PTSD, the exact neuropsychological mechanisms involved in cognitive functioning and PTSD-related symptoms like difficulties with concentration and memory remain unclear. While specific cognitive variables have been investigated, especially memory, attention, and executive functioning, links to symptoms have been difficult to demonstrate and replicate. Several elements of research design may account for researchers’ difficulties with this. Possible explanations for inconsistent results include study control groups with varying levels of trauma exposure, lack of exclusion criteria such as psychiatric and medical comorbidity, and differing levels of symptom severity among PTSD groups.

**PTSD Diagnostic Features**

According to DSM-IV (American Psychiatric Association, 2000), PTSD diagnosis requires an individual to have experienced, witnessed, or been confronted with a life-threatening event or events, actual death and/or serious injury, or threat to physical integrity to either themselves or another person (Criterion A1). An emotional response at the time of the event such as intense fear, helplessness, or horror is required (Criterion A2).
Diagnostic features of PTSD are re-experiencing (Criterion B), avoidance and numbing (Criterion C), and hyperarousal symptoms (Criterion D). Re-experiencing symptoms include unwanted thoughts or nightmares about the traumatic event, feelings of reliving the traumatic event, and psychological distress and physiological reactivity upon exposure to internal or external reminders of the trauma.

Additionally, individuals try to avoid both internal and external reminders of the trauma, including thoughts, conversations, people, places, or other trauma-related cues. They may have difficulty remembering important aspects of the traumatic event. Emotional numbing may also occur, as demonstrated by feeling detached from others, having a limited range of affect, and having a sense of a shortened future. Individuals also experience persistent symptoms of hyperarousal, including problems falling or staying asleep, irritability or anger outbursts, trouble concentrating, hypervigilance, and exaggerated startle response.

Symptoms must last longer than one month and lead to emotional distress or impairment in social or occupational functioning. Acute PTSD is specified if symptoms last less than three months, chronic PTSD if longer than three months, and delayed-onset PTSD if symptoms first appear six or more months following traumatic exposure (American Psychiatric Association, 2000).

**Prevalence**
A very high percentage of the US population is exposed to a traumatic event severe enough to potentially cause PTSD. The National Women’s Study (NWS; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993), a nationally representative sample of American women, found that 69.0% of women had been exposed to a traumatic event in their lifetime. Rates of exposure to traumatic events in the National Comorbidity Study (NCS; Kessler, et al., 1995) are 60.7% for men, and 51.2% for women. However, actual PTSD prevalence is much smaller. Data from the NCS suggest that lifetime prevalence in the general US population is 7.8%; the rate is almost twice as high for women (10.4%) as for men (5.0%). Considering that the vast majority of people exposed to traumatic events do not develop PTSD, it is particularly interesting to study potential causative biological and/or neurocognitive risk and resiliency factors. For example, a better understanding of neuropsychological mechanisms and biological correlates related to cognitive functioning in PTSD may help develop improved interventions.

**Psychiatric Comorbidity in PTSD**
A large percentage of individuals with PTSD have comorbid psychiatric disorders; in fact, PTSD is rarely seen without them. Breslau, et al.(1991) found that 83% of urban dwellers diagnosed with PTSD also met criteria for at least one additional disorder. In the NCS, Kessler et al.(1995) found that
88% of men and 79% of women with lifetime PTSD also had a history of at least one additional lifetime psychiatric disorder; the most common comorbidities are substance abuse, major depression, and personality disorders.

**Substance Abuse** As noted, several large-scale studies found high rates of concurrent PTSD and substance abuse, particularly in males. The Epidemiologic Catchment Area study (ECA; Regier et al., 1990) found that men were 5 times more likely and women 1.4 times more likely to have a history of substance abuse compared to those without PTSD. The NCS (Kessler, 1995) found that 35.4% of men and 17.8% of women with lifetime PTSD met the criteria for substance abuse.

Comorbid substance abuse is especially high among US combat veterans. It has been estimated that as many as 21% to 77% of Vietnam combat veterans with PTSD meet current criteria for concurrent substance abuse, and 91% meet criteria for concurrent lifetime substance abuse (Deering et al., 1996). High rates of substance abuse among Vietnam veterans seem to be related to symptoms of PTSD, and not just to their combat exposure. Both male and female Vietnam veterans with PTSD who took part in the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990) had significantly greater rates of lifetime alcohol abuse than combat-exposed veterans without PTSD.

This link between PTSD and high comorbid substance abuse is not seen in all combat-exposed individuals. For example, Israeli combat veterans with PTSD have low rates of substance abuse (Lerer et al., 1987). High rates in Vietnam veterans might be partially related to the cultural aspects of the Vietnam War, such as American drug culture in the 1960s, or easy access to drugs and alcohol in Vietnam (Deering et al., 1996). Study findings of cognitive functioning and PTSD using Vietnam combat veterans therefore may not be generalizable to other PTSD populations.

Substance abuse may be a means to self-medicate. The self-medication theory for PTSD/substance abuse posits that traumatized individuals use drugs and alcohol primarily to avoid PTSD symptoms (Brady, Back, & Coffey, 2004). Drugs and alcohol may also result in higher risk for trauma, such as motor vehicle accidents and criminal assault. Using...
longitudinal data, Chilcoat and Breslau (1998) found that pre-existing substance abuse at the time of traumatic exposure only slightly increased the chance of developing PTSD. Furthermore, they found that exposure to a traumatic event was not related to the development of substance abuse; however, PTSD was related to the development of substance abuse. Therefore, it seems plausible that PTSD occurs first, with substance abuse developing later. Substance abuse may also actually exacerbate symptoms of PTSD and reduce treatment adherence (Deering et al., 1996).

Research into the neurological pathways involved in substance abuse and PTSD suggests that they may share a neurological susceptibility. Alcohol and some drugs may help attenuate the startle process and hypervigilance symptoms in individuals with PTSD by acting on the same brain structures implicated in the fear response (amygdala and the prefrontal cortex) (Brady & Shinha, 2005). Brady and Sinha (2005) describe commonalities between neurological pathways in PTSD and substance abuse. They hypothesize that increased levels of corticotropin releasing factor (CRF) in the amygdala might be related to both hyperarousal and increased risk for substance abuse. CRF is released during stress, as part of the hypothalamic-pituitary-adrenal (HPA) axis. Brady and Sinha report that both stress and withdrawal from some drugs can lead to CRF stimulation of the locus ceruleus, resulting in increased cortical norepinephrine, which then causes CRF release in the hypothalamus and amygdala. Thus, a common neurological pathway may be related to both PTSD and substance abuse.

### Nicotine Use

Although smoking tobacco and nicotine use has not typically been reported in studies measuring cognitive functioning in PTSD, elevated nicotine use has been consistently found in trauma-exposed samples both with and without PTSD (e.g., Hapke et al., 2005). Further, the relationship between nicotine use and PTSD does not seem to be altered by controlling statistically for depressive symptoms (Thorndike et al., 2006).

The biological mechanisms underlying the relationship between nicotine, trauma exposure, and PTSD are not clearly understood. Research indicates that regular nicotine use is related to a decrease in reactivity of the HPA axis to both psychological and physical stressors, and to increased levels of norepinephrine and CRF in the amygdala central nucleus (see Rasmusson, Picciotto, & Krishnan-Sarin, 2006 for a review). Imaging and cognitive studies indicate that nicotine causes activation of the dopamine mesolimbic pathways, increases prefrontal cortex activation, and can lead to increased reaction time and improved performance on attentional tasks (see Brody, 2006 for a review). Most research on cognitive functioning in PTSD has neither reported nor
controlled for nicotine use. Thus, mixed results in previous studies of cognitive functioning in PTSD may be due, in part, to differing rates of nicotine use between subjects and differing rates of trauma exposure and nicotine use among non-PTSD control samples.

**Depression** Major depressive disorder is the most common comorbidity in a variety of trauma-exposed populations (Kessler et al., 1995): survivors of the Lockerbie plane crash, the Buffalo Creek dam collapse, civil violence in Northern Ireland, and war-exposed Cambodian civilians. In Vietnam combat veterans with PTSD, depression is the second most-common comorbid condition after substance abuse (Deering et al., 1996). According to data from the National Vietnam Veterans Readjustment Study (NVVRS), Vietnam veterans with PTSD have a 20% lifetime prevalence rate of depression (Helzer, Robins, & McEvoy, 1987) and rates of depression in veterans seeking treatment are even higher (26% to 65%;). Data from the NCS indicate that depression is more likely to be due to PTSD, and that about 26% of individuals with PTSD also have concurrent depression (Kessler et al., 1995).

In addition, PTSD and depression have many symptoms in common, making it difficult to separate the two diagnostically, such as loss of hope for positive future outcomes, insomnia, and diminished concentration. The emotional detachment and restricted affect seen in PTSD may be similar to symptoms of depressed mood. The common diagnostic features have led some researchers to believe that they are not truly separate disorders, and that the overlap of symptoms might actually represent a depressive subtype of PTSD (Friedman & Yehuda, 1995).

**Treatment-Seeking Issues** The majority of individuals studied are seeking treatment for their PTSD. Clinical samples of PTSD patients, e.g., combat veterans, may have more severe PTSD, be more likely to have additional comorbidities, and be medicated. Further complicating this issue among veteran groups is the issue of financial compensation for combat-related PTSD, which may influence symptom reports. Thus, they may be less motivated to perform well on neuropsychological testing if

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Many valuable resources may be overlooked if one does not include both the words “head injury” and “brain injury” in literature searches.
they are seeking compensation for PTSD (Horner & Hamner, 2002).

The high rates of psychiatric comorbidity, including substance abuse and depression, found in Vietnam veterans with PTSD makes it unclear whether cognitive deficits seen in these populations can be generalized to other samples of individuals with PTSD (Golier et al., 2002). Alcohol abuse has been associated with impaired memory and executive functioning performance, even if remote (Horner & Hamner, 2002). The current research described below attempts to overcome many of these potential confounds by drawing from a non-treatment seeking, university student population with a lower incidence of comorbid depression and substance abuse than is typically seen in studies of PTSD and cognitive deficits.

**Traumatic Brain Injury (TBI)**

The term “traumatic brain injury” typically is used synonymously with "traumatic head injury." Organizations use one or the other term interchangeably in their names and populations they serve. For example, the Alabama Head Injury Foundation and the San Diego Brain Injury Foundation serve the same types of clientele and have similar missions. "Brain injury" is gradually replacing "head injury" because enduring and problematic symptoms of this injury derive from damage to the brain rather than to the skull or scalp. Thus, the "National Head Injury Foundation" of the 1970s has gradually become today's "Brain Injury Association of America."

While the distinction between "head" and "brain" superficially may appear trivial, it has important clinical implications. Much high-quality scientific and clinical brain injury information is packaged under the title head injury information. For example, two of the most seminal volumes on brain injury are entitled *Neurobehavioral Consequences of Closed Head Injury* (Levin, Benton, & Grossman, 1982) and *Mild Head Injury* (Levin, Benton, & Eisenberg, 1989), and many valuable scientific and clinical contributions to the present day may be overlooked if one does not include both the words "head injury" and "brain injury" in literature searches. For clarity, we will interchangeably use the terms traumatic brain injury (TBI) and concussion here.

TBI typically is characterized as mild, moderate, severe, or penetrating. Penetrating TBI (also called "open-head injury") refers to penetration of the skull and dural layer by foreign objects or, as is often the case, by bone fragments from the injured person. Such penetrations can occur anywhere on the skull and can produce brain lesions ranging from small and focal (e.g., a small bone fragment from a depressed skull fracture) to extensive and widespread (e.g., a large caliber but low velocity bullet ricocheting within the cranial vault). Non-penetrating TBI (also called "closed-head injury")

*continued next page*
refers to trauma caused by external mechanical forces. Note that skull fracture by itself is not a penetrating brain injury and is not an indicator of injury severity.

TBI severity is measured by the neurologic status, most commonly with the Glasgow Coma Scale (GCS; Jennett and Teasdale, 1981). The GCS results in a score of 3-15 and is based upon eye-opening, motor responses, and verbal responses. Through convention and common use, mild TBI refers to GCS scores of 13-15, moderate TBI to GCS scores of 9-12, and severe TBI to GCS scores of 8 or below. The most important caution for the life care planning in using GCS to assess TBI severity is to be aware that the GCS is a dynamic score, often increasing dramatically over a period of hours. A person in the Emergency Department in coma within 30 minutes of injury, but who over a period of hours becomes responsive, ambulatory, and communicative, may have a GCS of 8-9 on admission, but within hours may have a GCS of 14 or 15. The GCS thus is meaningful only with the context of the time since injury that it was administered. Our experience is that GCS scores from EMT records usually are paired with information of time of injury, but that GCS scores in hospital medical records must be examined carefully to determine the duration since injury in which they were obtained.

Moderate and severe TBI, both closed and penetrating, have been described since the days of Socrates and Plato and are the subject of extensive multidisciplinary scientific and clinical literature and experience (e.g., Grimm and Bleiberg, 1986; Bleiberg, Cope, and Spector, 1989; Silver, McAllister, and Yudofsky, 2005). Mild TBI (mTBI), on the other hand, has remained a conundrum with heated controversy to the present day. Clinicians’ opinions regarding diagnosis, treatment, prognosis, and long-term vulnerabilities to neurodegenerative and other diseases that may appear decades following injury differ widely. While this paper cannot do justice to all the above controversies, it will focus upon several of the mTBI issues most pertinent to LCPs.

**mTBI Diagnostic Features**

Many scholarly organizations have attempted to define mTBI and have produced similar, though slightly overlapping, definitions. The main difficulty is the concept of "mildness" of injury: what is the lower threshold for considering a "bump on the head" to be mTBI? There also are different opinions about whether mTBI and concussion are synonymous or whether they refer to different diagnostic entities. Highly sophisticated groups have addressed but not resolved "mildness" in mTBI. (Sidebar, next page)

These definitions all share the very important element of emphasizing that LOC is not necessary for
the diagnosis of concussion or mTBI, thus correcting one of the most common and stubbornly resistant misconceptions regarding concussion. However, while "dazed and confused" certainly is an appropriate criterion for diagnosing concussion (e.g., the football player who walks to the wrong huddle), the symptom is problematic because its lower threshold is difficult to determine and because many conditions can create a subject who is "dazed and confused" for reasons other than cerebral concussion. For the LCP, thus, it can be challenging simply to determine whether or not a concussion has occurred from clinical documentation.

Further, the above diagnostic criteria are pertinent to the patient’s status at the time of injury. Diagnosis of concussion severity is entirely separate from diagnosis of severity of concussion sequelae. It is perfectly possible to have a mild concussion with good outcome, or a mild concussion with a spectacularly bad outcome; severity of outcome is entirely unrelated to diagnosis of severity of injury.

Numerous studies have indicated that primary initial symptoms of concussion are headache, impaired concentration, impaired memory, blurred or double vision, balance problems, sensitivity to light and noise, fatigue and malaise, and sleep disturbance (Lew et al., 2007). Recovery in most patients with a single concussion takes place in approximately 7-10 days (Bleiberg et al., 2004), though as Ruff and colleagues note, there is a "miserable minority" of approximately 15% who do not show the expected uneventful recovery and may suffer for months or years (Ruff, Camenzuli, & Mueller, 1996). Note that most data regarding duration and quality of concussion recovery are based on samples with a single concussion. In military populations with multiple blast concussion exposure and civilian populations with history of multiple concussions (as is common...
in athletes), recovery is slower and less complete. The LCP reviewing a concussion history should be sensitive to the number of concussions, but also should be vigilant to certain warning signs: concussions that are closely spaced in time, suggesting that recovery from an earlier concussion has been incomplete and perhaps has set the stage for a subsequent concussion; evidence that recovery from successive concussions is taking longer and longer with each new concussion; and evidence that increasingly minor injuries are causing concussions.

**Prevalence**
Estimates of brain injury occurrence rates vary substantially, which is not surprising given the lack of a national registry for these injuries. Estimates range from a low of nearly 100 per 100,000 population to nearly 600 per 100,000 population (Silver et al., 2005). Concussion and mTBI are estimated to comprise 80 to 90% of all injuries. Note that even if mTBI/concussion is only 10% of the lowest estimate, the result is 300,000 mTBIs per year in the United States. Most importantly, this is certainly an underestimate. Many, if not the majority, of persons with mTBI/concussion do not seek medical attention, and their number is unknown. Some who do not seek medical attention recover rapidly and uneventfully, but some are exemplified by a patient recently seen by one of the authors. He was a university football player who had three concussions in four days. When the neuropsychologist incredulously asked the patient how this had happened, the player unabashedly (and perhaps with some pride) stated that he had "lied" and "hidden" the first two concussions. The third concussion left him with other symptoms too severe to hide, including a migrainous headache requiring hospitalization.

Reverse reporting bias also exists. There is a high prevalence of post-concussive symptoms in populations in litigation and with other sources of secondary gain. The LCP should always insist that neuropsychological assessment include measures of effort.

Perhaps the most troubling questions concern cumulative effects of recurring concussion, both in the short- and long-term. Unfortunately, there are no prevalence studies, and almost all existing studies are retrospective. Efforts are underway in the military and professional sports to develop "brain banks" to examine this disturbing possibility.
Psychiatric Comorbidity in Concussion

Concussion and mTBI never occur in a vacuum. They are stressful health events within the context of an ongoing life, adding difficulty and burden to that life. Persons have different resources (intrapersonal, interpersonal, psychosocial, and financial) to cope with this additional burden. These differences influence outcome and recovery as much as, and sometimes more than, the actual symptoms of concussion.

In the military context, the comorbidity between concussion and PTSD is clear. However, the combination of these two disorders also is not infrequent in the civilian world. Spousal and child abuse, injury occurring with natural disaster, and certain industrial and motor vehicle accidents (MVA) all can cause both. One of the authors had a patient who was in an MVA in which she sustained a concussion; her son was killed. She was unconscious for only 15 to 30 seconds, but it took over an hour for rescue workers to extricate her from the wreck.

Nursing Diagnoses to consider in PTSD, TBI: *A partial list, Ed.*

NANDA International Nursing Diagnosis, 2009-2011

- **Post Trauma Syndrome**: Sustained maladaptive response to a traumatic, overwhelming event
  - Domain 9, Coping/Stress Tolerance
  - Class 1: Post Trauma Responses
- **Risk for Post Trauma Syndrome**: At risk for sustained maladaptive response to traumatic, overwhelming event
  - Domain 9, Coping/Stress Tolerance
  - Class 1: Post Trauma Responses
- **Rape-Trauma Syndrome**: Sustained maladaptive response to a forced, violent sexual penetration against the victim’s will and consent
  - Domain 9, Coping/Stress Tolerance
  - Class 1: Post Trauma Responses
- **Anxiety**: Vague uneasy feeling of discomfort or dread accompanied by an autonomic response, source often nonspecific or unknown to the patient; feeling of apprehension caused by anticipation of danger
  - Domain 9, Coping/Stress Tolerance
  - Class 2: Coping Responses
- **Disturbed Sensory Perception**: Change in the amount or patterning of incoming stimuli accompanied by diminished, exaggerated, distorted, or impaired response
  - Domain 5, Perception/Cognition
  - Class 3: Sensation/Perception
- **Ineffective Health Maintenance**: Inability to identify, manage, and/or seek out help to maintain health
  - Domain 1, Health Promotion
  - Class 2: Health Management
- **Fatigue**: An overwhelming sense of exhaustion and decreased capacity for physical and mental work at the usual level
  - Domain 4, Activity/rest
  - Class 3: Energy Balance
- **Self-Care Deficit** (bathing, dressing, feeding, toileting)
  - Domain 4, Activity/Rest
  - Class 5: Self-Care
- **Impaired Memory**: Inability to remember or recall bits of information or behavioral skills
  - Domain 5, Perception/Cognition
  - Class 4: Cognition
- **Risk for Compromised Human Dignity**: At risk for perceived loss of respect and honor
  - Domain 6, Self-Perception
  - Class 1: Self-Concept
- **Hopelessness**: Subjective state in which an individual sees limited or no alternatives or personal choices available and is unable to mobilize energy on his own behalf
  - Domain 6, Self-Perception
  - Class 1: Self-Concept
- **Caregiver Role Strain**: Difficulty in performing family caregiver role
  - Domain 7, Role Relationships
  - Class 1: Caregiving Roles
- **Interrupted Family Processes**: Change in family relationships or functioning
  - Domain 7, Role Relationships
  - Class 2: Family Relationships
Throughout this time she had little ability to move and the side of her head rested against the feet of her son, whom she could tell was dead or fully unresponsive. While she had several weeks of symptoms such as photophobia and dizziness from her concussion, her primary problem was that she was comorbid with both PTSD and an unresolved grief reaction that became a severe depression.

In patients who do not promptly recover from concussion, comorbidities must be investigated. In some cases, these can be physiological abnormalities such as endocrine dysfunction, particularly anterior pituitary abnormalities (Kreitschmann-Andermahr, 2008), sleep and chronic pain disturbances (Silver et al., 2005), and other medical conditions.

**Summary**

The current article describes both PTSD and mTBI as psychiatric conditions with multiple physical comorbidities. Routine screening and assessment for these diagnoses should be included in Life Care Plans for persons with these conditions.

**References**


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Patricia Brock RN MSN LNCC CLCP

I used to think I was a good writer. (Note the past tense.) Then some weeks ago I began the online PhD in Nursing program with the University of Phoenix. The difference between the way I was writing and the way a doctoral student is expected to write is summed up in one word: “scholarly.” As the class syllabus indicated, “You are no longer reading articles and writing reports for your job; you are providing the blueprints and the information for those who are doing that. You are reading, dissecting, evaluating and writing the articles.”

Scholarly writing presents a hypothesis, develops the theme, and defends it through research and original opinion. Nurse Life Care Planners do communicate the result of our data collection, dissection, and evaluation in our Plans. Although there is a difference between writing a journal article and putting together a Life Care Plan, promoting good scholarship in our profession will lead to more professional work.

The doctoral program focuses on scholarship, leadership, and practice. The orientation class, *Doctoral Success and Communication Strategies*, includes mostly non-nurses and focuses on information literacy with regard to each individual’s practice area. I am astounded by what I did not know about research and scholarly writing. Although I dread the statistics courses I will take, as a nurse and a Life Care Planner I understand I must obtain and maintain the skills necessary to conduct, analyze, and communicate research.

As an Associate Degree nurse, I was not exposed to real research. I thought reading current health magazines was enough to keep me updated. Although BSN and MSN programs boosted my research knowledge and skills, in my opinion basic research methodology and the skills necessary to interpret and understand research literature should be taught in every nursing program. Each nurse must learn why understanding research and applying findings to daily clinical practice is critical.

As Life Care Planners, we have a responsibility to teach those we serve. We educate patients, attorneys, judges, and our peers. I hope every one of us will strive to perfect and enhance professional information literacy skills. It is not enough to be able to find research articles for a desired topic. One needs to know how to recognize an article as peer reviewed and how to analyze and interpret it to gain new insight.

Our profession depends on all of us, regardless of specialty, to ensure that the practice of Life Care Planning is evidence–based. We facilitate quality outcomes by using consistent and reliable methods to collect and analyze data to develop Life Care Plans. We protect, preserve, and promote our credibility by presenting valid supportive documentation for every Plan.
Shelene J. Giles RN, BSN, BA, MS, CRC, CNLCP, MSCC, CLCP

I always found comfort in helping others. At a young age, I began working with disabled teenagers, teaching them appropriate social behaviors and work skills. This path eventually lead me further into medical issues, which is why I pursued nursing. My focus shifted toward case management of catastrophic injuries/illness. Understanding the life-changing events of the catastrophic injury or illness and the benefit of a nursing perspective in the litigation process, my attention has been on participating in the settlement process (life care plans, Medicare Set-Asides, and consulting) for the past 10 years.

I have two passions in my profession: sharing my knowledge with others and assisting those with catastrophic burns. I distinctly remember the first burn patient that I cared for while in nursing school. The sight, smell, and outcry of pain was overwhelming and my first reaction was avoidance. Then, about 5 years ago I was given the opportunity to assist in the Life Care Planning process of those with catastrophic burns. With God’s divine intervention, my perceived fears were put aside to assist others who live these fears every day. Catastrophic burns has become my Life Care Planning specialty. It is truly amazing to be a part of a burn survivor’s journey and take away valuable life lessons.

I am married, with two sons, ages 11 and 13. We will be celebrating our 20th wedding anniversary with a family vacation to Alaska.

Judy Seidmeyer, RPh FACA

I really did not plan to become a caregiver—it’s just what life handed me when it was least convenient. I was working as a senior healthcare executive for a major computer corporation when my only sister, and only remaining family member, was diagnosed with a very aggressive form of cancer. Suddenly, a decision had to be made: leave her alone to suffer through the horrors of chemotherapy, multiple surgeries, and radiation, or set aside my hard-earned career position and give her what comfort and dignity I could. Clearly, there was no choice. I took a year’s leave of absence from work and took over all the tasks of managing her IVs, her illness, her doctor appointments at the Mayo Clinic three hours from home, her bathing, her hydration, her household, her life. Mine went on hold. But as a person always driven to do my best, I determined that my 6 years of pharmacy education and my 30 years of career accomplishments could help me move into this most important job of my life. And from it came a critical realization that not all the challenges of daily living have acceptable resolutions. While we were always able to get excellent medical care, even in her home, the most basic daily need of a decent shower was not possible. From that year of watching both her health and dignity decline, I determined that I could not simply accept

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this ugly fate for someone I love. And I didn’t. I, along with my husband and two friends, designed and patented a shower for use by anyone who could sit in a wheelchair, be they temporarily or permanently disabled.

In the 7 years that have now passed, I have learned a tremendous amount from the individuals we seek to help now, and know that I can give perspective on alternatives for hygiene care that come from not only a solution provider and company owner, but also, and most importantly, from a woman who did her research and really did help to keep her sister alive and as healthy as possible against incredible odds. My greatest joy now comes from reading letters from other individuals with disabilities who are also feeling healthier, happier, and cleaner, because of a simple portable shower. What a gift that is to me!

Mona Yudkoff, RN BSB MPH

One of the decisions a Life Care Planner faces is whether to make the leap from solo practitioner to employer. Early in my practice I realized that the number of Life Care Plans I could produce was limited by the hours I wanted to spend working. If I wanted the business to grow, I needed help.

My first employee was someone with secretarial experience, but she could not provide the level of assistance I needed. When I hired a former math teacher who was at home raising her family and looking for part time work, I soon realized I had a perfect fit. She was intelligent, capable, and a real problem-solver; she was able to do much of the costing research and all of the calculations needed for Life Care Plans, and proof and edit text.

She led me to a wonderful pool of underemployed women who were educated and smart, but because they had stayed home to raise children, found themselves without the work experience needed to land a good job. I soon understood that the skills one acquired when raising a family and managing a home were just what I needed to “grow” my business.

As an added plus, since I worked out of my home for many years, I was able to hire friends and neighbors, ensuring that I was comfortable giving access (and keys) to my home. The job offered the employees flexible scheduling and a convenient location. It was a mutually beneficial match.

All of my current and past employees have either been friends and neighbors or have been referred to me through word of mouth in the neighborhood. We have developed a balance between friendship and the employee-employer relationship at work. I would strongly recommend looking for a ‘stay-at-home” mom who wants to return to the workforce for your next hire.

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